

# *Service Manual*

## **4-CHANNEL RECEIVER**

**QX-9900/FW**

# 1. SPECIFICATIONS

## SEMICONDUCTORS

FETs .....	8
ICs .....	4
Transistors .....	113
Diodes .....	62

## POWER AMPLIFIER SECTION

Music Power Output (IHF)	240W (4Ω) 180W (8Ω)
Continuous Power Output (1kHz each channel driven)	50W/50W/50W/50W (4Ω) 38W/38W/38W/38W (8Ω)
Continuous Power Output (1kHz 2 channels driven)	45W + 45W/45W + 45W (4Ω) 35W + 35W/35W + 35W (8Ω)
Continuous Power Output (1kHz 4 channels driven)	36W x 4 (4Ω) 30W x 4 (8Ω)
Power Output in the Range of 20Hz to 20kHz	
(2 channels driven)	33W + 33W/33W + 33W { 8Ω, Harmonic Distortion }
(4 channels driven)	28W x 4 { less than 0.5% }
Harmonic Distortion	Less than 0.5% (Continuous Power Output) Less than 0.03% (8Ω, 18W + 18W/18W + 18W Power Output)
Intermodulation Distortion	Less than 0.5% (Continuous Power Output) Less than 0.05% (8Ω, 18W + 18W/18W + 18W Power Output)
Power Bandwidth (IHF)	
2 channels driven	5Hz to 80kHz (8Ω, Harmonic Distortion
4 channels driven	5Hz to 70kHz less than 0.5% )
Frequency Response	5Hz to 90kHz, ± 1 dB
Input Sensitivity/Impedance	500mV/50kΩ
(1kHz Continuous Power Output)	
Speakers	2 pairs for Front, 2 pairs for Rear (4 to 16Ω)
Headphone Jacks	Front and Rear
Damping Factor	50 (8Ω, 1kHz)
Output Level Meters	0 dB = 35W/8Ω (4 channels)

## PREAMPLIFIER SECTION

Output Voltage	500mV (Rated output), 4.5V (Max.)
Harmonic Distortion	Less than 0.5%
Frequency Response	10Hz to 20kHz, ± 1 dB
Input Sensitivity/Impedance	PHONO 1 MAG 2.9mV/45kΩ
(1kHz, for rated output)	PHONO 2 MAG 2.9mV/45kΩ
	MIC 3.8mV/50kΩ
	AUX 1, 2 200mV/60kΩ
	TAPE MONITOR 1, 2 200mV/60kΩ
Recording Output	TAPE REC 1, 2 (Pin jack) 200mV
	TAPE REC (DIN connector) 35mV
BASS Control	-10.5 dB, +10.5 dB/100Hz
TREBLE Control	-10 dB, + 9.5 dB/10kHz

## FM TUNER SECTION

Frequency Range	88MHz to 108MHz
Usable Sensitivity (IHF)	1.8 μV
Capture Ratio (IHF)	2 dB
Selectivity (IHF)	More than 70 dB
Image Rejection	More than 85 dB (98MHz)
IF Rejection	More than 100 dB (90MHz)
Spurious Rejection	More than 90 dB (98MHz)
AM Suppression	50 dB
Signal to Noise Ratio	70 dB
Harmonic Distortion	Mono: less than 0.3% (100% Mod.) Stereo: less than 0.5% (100% Mod.)
Tuning Indicator	Signal strength type and Center tuning type
Muting	Switchable to ON-OFF
Stereo Separation	More than 40 dB (1kHz)
Sub Carrier Suppression	More than 50 dB
Noise Filter	Switchable to ON-OFF
Antenna Input	Impedance 300Ω balanced and 75Ω unbalanced
De-emphasis	75μsec and 50μsec (switchable)

In some countries, model QX-9900 is delivered with a selector switch for adjusting the FM de-emphasis from 50 to 75μsec. If your unit is equipped with such a switch on the chassis, and if the high sound range gives an impression of weakness, move the de-emphasis switch to its other position.

## AM TUNER SECTION

Frequency Range	525kHz to 1,605kHz
Usable Sensitivity (IHF)	10 μV
Selectivity (IHF)	More than 35 dB
Image Rejection	More than 80 dB (1,000kHz)
IF Rejection	More than 75 dB
Signal to Noise Ratio	More than 50 dB
Antenna	Built-in ferrite loopstick antenna

## MISCELLANEOUS

Power Requirements	110V, 120V, 130V, 220V and 240V (Switchable)
	50-60Hz
Power Consumption	480W (Max.)
AC Outlets	Switched 1, Unswitched 2
Dimensions (overall)	22-1/16 in./560mm (width) 6-11/16 in./170mm (height) 16-15/16 in./430mm (depth)
Weight	Without package 46 lb 14 oz/21.3 kg With package 56 lb 12 oz/25.8 kg
Furnished Parts	FM T-type antenna 1 Speaker plugs 8 Polishing cloth 1 Operating instructions 1

## 2. FRONT PANEL FACILITIES-1

### POWER SWITCH

Push once to switch the power ON, once again to turn it OFF.

### 4/2 CHANNEL INDICATOR

Lights up in accordance with the position of the MODE switch.

### LEVEL METERS

Indicate output level of the amplifier.

### SPEAKER SWITCHES

Up to four pairs of speakers can be connected and switched on and off (in pairs) with the SPEAKER switch buttons. Button released: respective pair of speakers in operation. Button depressed: respective pair of speakers off. (When released, these buttons light up.) For correlation with 2-channel or 4-channel mode, see explanations for MODE switch.

### PHONES JACKS

Plug the headphones into FRONT jack to hear the left and right front channels. Likewise, plug the headphones into REAR jack to hear in the left and right rear channels.

### FILTER BUTTONS

**LOW:** Use this filter to cut out low-frequency noise (hum, rumble).

**HIGH:** Use this filter to cut out high-frequency noise (hiss).

### LOUDNESS BUTTONS

The loudness circuit compensates for an apparent loss in very low and very high frequency ranges when the listening volume is rather low. At normal and high volumes, leave these buttons in OFF position (released). The left button functions on the front channels, the right button on the rear channels.

### AUDIO MUTING BUTTON

With this switch set to -20dB position, the output level is attenuated by 20dB.

### VOLUME CONTROL

Controls the output volumes of all four channels simultaneously. Turning the knob to the right will increase the volume.

### SELECTOR SWITCH

This switch selects the program source.

AM . . . . . AM reception.

FM MONO . . . . . FM monophonic reception only.

FM AUTO . . . . . FM reception, with automatic switching for either stereo or monophonic programs.

PHONO 1 . . . . . For playing records on a turntable plugged into the PHONO 1 jacks.

PHONO 2 . . . . . Same as above for PHONO 2 jacks.

AUX 1 . . . . . For playing signals fed to the AUX 1 jacks.

AUX 2 . . . . . Same as above for AUX 2 jacks.

### MODE SWITCH

Selects the various 2-channel and 4-channel listening modes.  
**2 CH STEREO . . . . .** Used for reproduction of 2-channel stereo. Use this position for listening to FM monophonic and AM broadcasts.

**4 CH STEREO MATRIX-REGULAR . . . . .**

Used for 4-channel reproduction of regular matrix records or FM stereo broadcasts playing matrix records. Also use this position when listening to 2-channel records and FM stereo broadcasts, adding 4-channel effects.

**MATRIX-SQ . . . . .** Used for 4-channel reproduction of SQ system records and FM broadcasts with the use of SQ record. Also use this position when listening to 2-channel stereo records and FM stereo broadcasts.

**DISCRETE . . . . .** Used for reproduction of discrete 4-channel tapes and cartridge tapes. If a decoder is added, this position may be used to reproduce discrete 4-channel records (CD-4).

**NOTE:** With this switch set to 2 CH STEREO, sound from the rear left speaker (CH. 2) will be the same as that from the front left speaker (CH. 1) while sound from the rear right speaker (CH. 4) will be the same as that from the front right speaker (CH. 3). To hear the front speakers only, turn off the rear speakers by operating the SPEAKER switches.

### BALANCE CONTROLS

**FRONT . . . . .** Controls the relative volume of the front left and right channels.

**FRONT / REAR . . . . .** Controls the relative volume of the two front channels as opposed to the two rear channels.

**REAR . . . . .** Controls the relative volume of the rear left and right channels.

### METER LEVEL BUTTONS

Select meter sensitivity.

**-10dB:** Push this button, the level meters indicate 10dB more than actual output level. Therefore, subtract 10 from the meter reading to obtain actual output. E.g. when the meter is indicating -3dB, the actual output level is -13dB.

**-20dB:** Level meters indicate 20dB more than actual output level. Subtract 20 from the meter reading to obtain actual output.

**-30dB:** With both buttons pushed, the meters indicate 30dB more than actual output level.

**NOTE:** When -10dB and -20dB buttons are not pushed, the level meters indicate actual output level. A reading of 0dB indicates 35W per channel into an 8Ω load.

(Continued on pp. 5, 6.)

### 3. FRONT PANEL FACILITIES-2

#### FM TUNING METER

Meter for indicating correct FM tuning. After the SIGNAL meter reading has been peaked, adjust tuning so that the pointer of this meter falls at the center mark.

#### SIGNAL METER

Indicates the intensity of the received AM or FM radio signal.

#### FM STEREO INDICATOR

This lamp lights when an FM stereo broadcast is being received.

#### TUNING KNOB

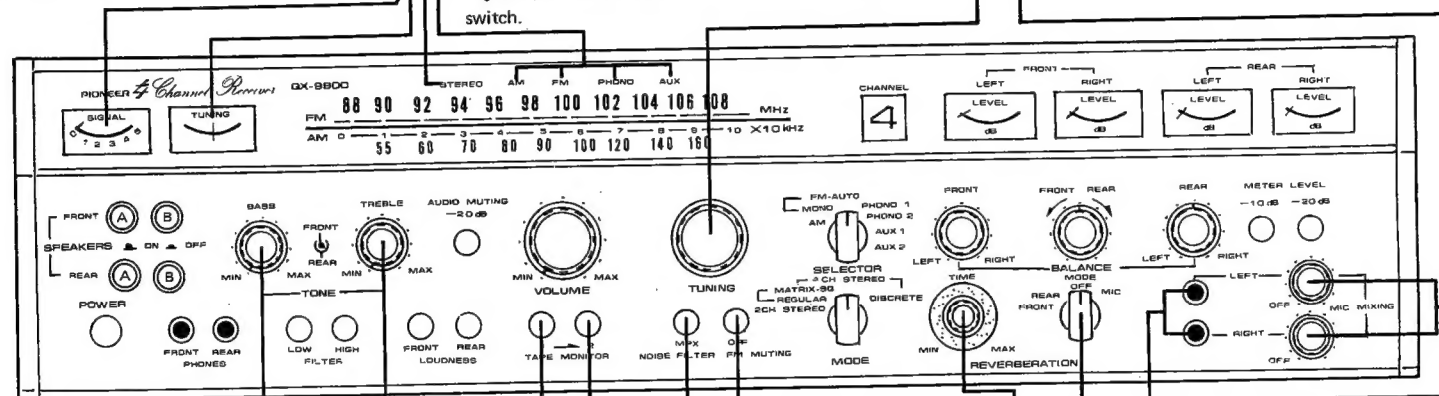
For tuning in AM and FM stations.

#### PROGRAM INDICATORS

Lights up in accordance with the position of the SELECTOR switch.

#### MIC MIXING LEVEL CONTROLS

To add microphone sound to a program, plug one or two microphones into the MIC jacks and turn one or both of these controls clockwise until you obtain the desired balance between microphone sound and the underlying program. If only one microphone is connected, its sound will be heard through both front speakers if the MIC MIXING control for the other channel is at position OFF. To add microphone sound to one channel only, the other control must be turned clockwise, too.



#### BASS CONTROLS

Turning the control to the right will increase the tone, and to the left will decrease the tone. The smaller (inner) knob controls the front channels, the larger (outer) one controls the rear channels.

#### TREBLE CONTROLS

Use these controls in the same way as the BASS CONTROLS.

#### TAPE MONITOR SWITCHES (1 and 2)

These switches are set to ON for checking the recording conditions or for playback with tape decks.

1. This switch is set to ON for monitoring a recording in progress or for playback with a tape deck plugged into the TAPE 1 MON and TAPE 1 REC jacks.
2. This switch is set to ON for checking the recording conditions or for playback with a tape deck plugged into the TAPE 2 MON jacks and TAPE 2 REC jacks.

**NOTE:** For a record playback or listening to broadcasts, leave these switches set to the OFF position. With the switches set to ON no sound will be heard.

#### MPX NOISE FILTER BUTTON

Push this button to ON to eliminate high-frequency noise during FM stereo reception.

#### FM MUTING BUTTON

In released position, the FM muting circuit cancels out noise on unused FM bands (inter-station noise), but it also rejects very weak, faint FM stations. To receive such a station, push the button to turn off the FM muting circuit.

#### MIC JACKS (LEFT and RIGHT)

The microphone should be of high impedance.

#### REVERBERATION MODE SWITCH

To add a reverberation effect, turn this switch to one of the following positions:

FRONT..... Reverberation effect only in front channels.  
 REAR..... Reverberation effect only in rear channels.  
 MIC ..... Reverberation added only to microphone sound.

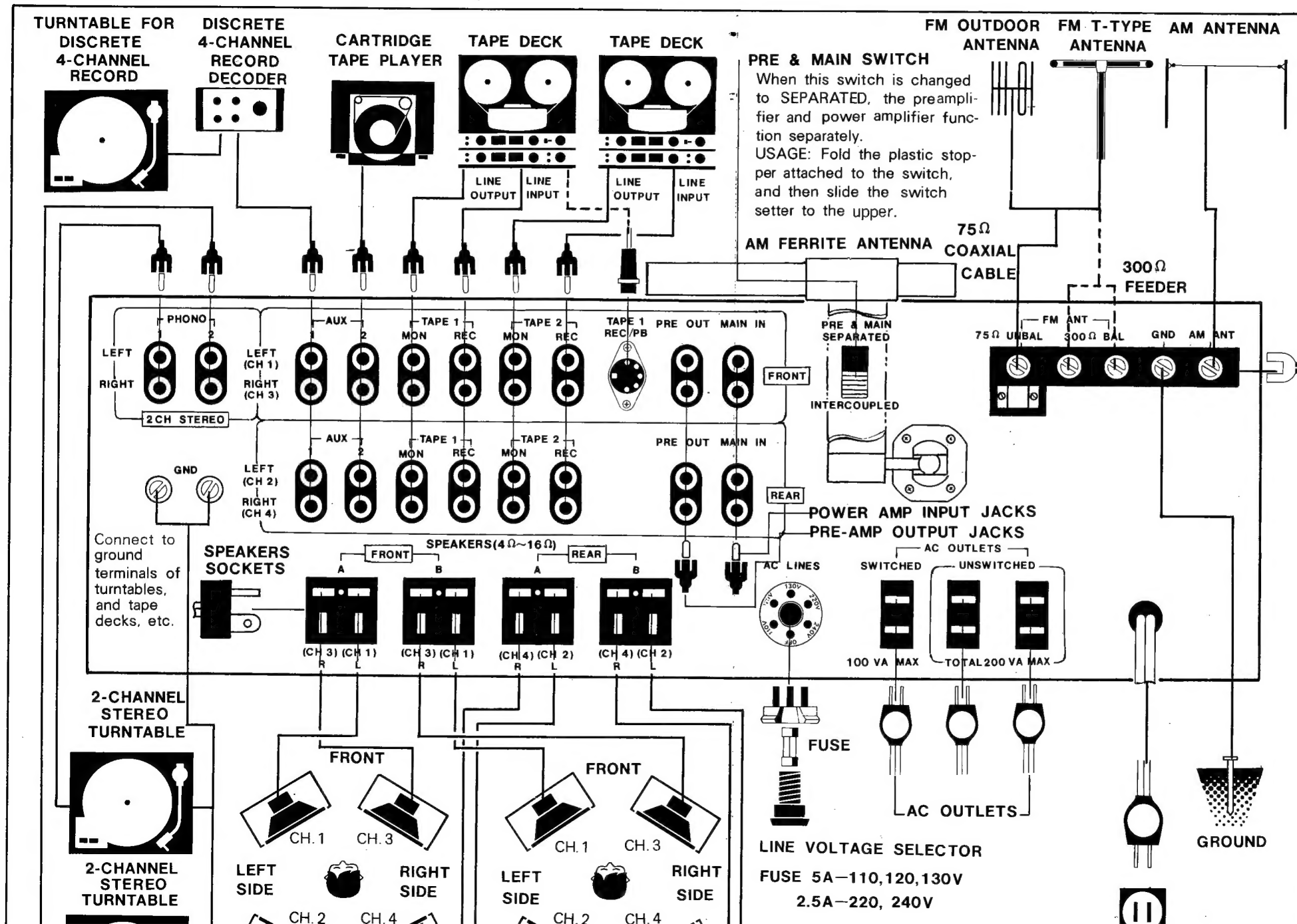
OFF ..... No reverberation.

- No reverberation is added to the signals obtainable from the TAPE REC outputs.

#### REVERBERATION TIME CONTROL

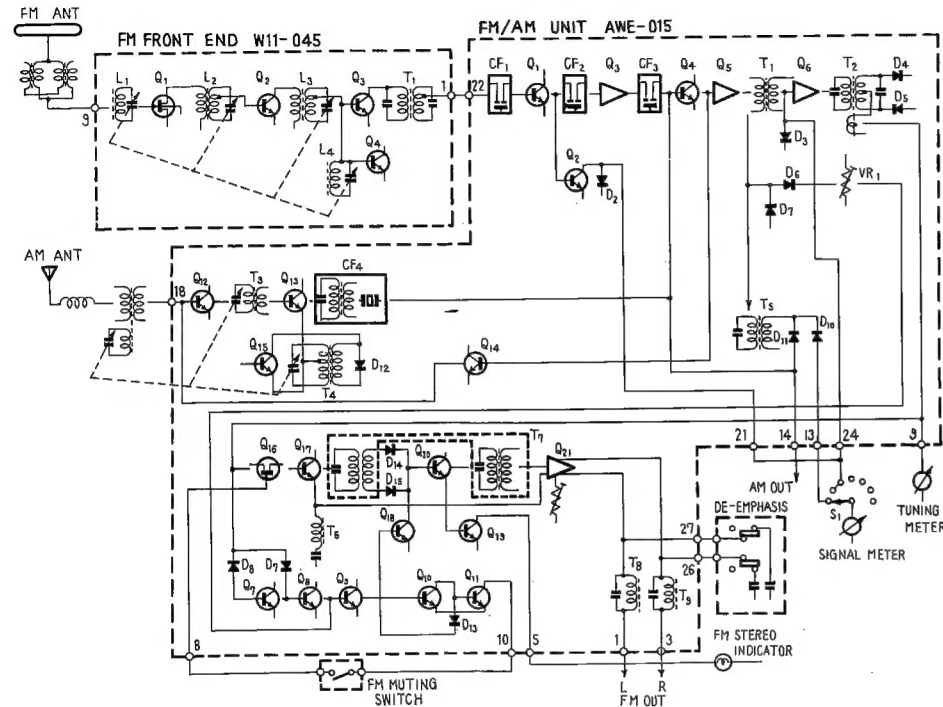
Used in combination with the REVERBERATION MODE switch. Clockwise rotation causes longer reverberation time, counterclockwise rotation shortens the reverberation time.

## 4. CONNECTION DIAGRAM



## 5. CIRCUIT DESCRIPTION

### 5.1 RF CIRCUITRY



#### • Antenna Circuit

**FM:** The antenna signal enters the receiver through the antenna terminals of 300Ω (for ribbon-type antenna feeder) or 75Ω (for coaxial antenna cable). The 75Ω input enters the front end directly, the 300Ω balanced input passes through impedance matching coil.

**AM:** The ferrite loopstick antenna coil serves as inductance for the top tuning circuit.

#### • FM Front End

The front end consists of two tuned RF amplifiers Q1 and Q2, converter Q3, and split-type local oscillator Q4. The oscillator frequency is varied from 98.7MHz to 118.7MHz and serves as source for the converter, Q3. There, the amplified 88MHz to 108MHz RF input signal is mixed with the 98.7MHz to 118.7MHz oscillator signal.

#### • FM IF Amplifier

The 10.7MHz output from T1 of the front end is supplied to the 10.7MHz IF bandpass filter CF1 which consists of tuned ceramic elements. The output from this filter enters the next transistor, Q1. The signal amplified there is on its collector side to produce the current necessary for driving the signal strength meter, Q3 ~ Q6, the sharp bandpass ceramic filters CF2 and CF3, and the tuned circuit of T1 provide amplification and limiting of the 10.7MHz IF signal. (Q4 and Q5 also act as 455kHz IF amplifiers in AM reception mode.)

The trigger voltage for the FM muting circuit is taken from the DC voltage output of the ratio detector. This DC output also includes, in the case of an MPX program, the L + R, L - R and 19kHz pilot signals.

#### • Muting Circuit

This circuit consists of a gate circuit FET Q16, a block of DC-amplifier Q7, Q8, Q9, Schmitt circuits Q10 and Q11. Detector output enters Q16 and, through a rectifier, Q7 and Q8. The gate circuit of Q16 and the collector of Q11 are controlled by the FM MUTING switch.

When detuned, the ratio detector output has positive or negative DC voltage, which makes Q7 or Q8 conductive, depending on its polarity. On the other hand, voltage determined by IF strength is supplied to the Q5 and controlled by the semi-fixed 100kΩ VR (muting threshold control). These two kinds of trigger voltage, besides turning Q9 on and off, also alternately switch the Schmitt circuit of Q10 and Q11. This operation causes a voltage variation on pin 8 and opens and closes the FET Q16 gate when the muting switch is set to ON. The output of the gate circuit FET is taken from the source side of Q16 because there is no output to the MPX decoder circuit when Q16 is off.

D13 and the charge capacitor form a shunt circuit to eliminate bursts of noise which occur at the border between tuning and detuning.

#### • MPX Decoder

The composite signal of an FM MPX broadcast, containing L + R, L - R and 19kHz pilot signals, is supplied from the gate circuit to Q17 in the first stage of this circuit. This stage serves as a tuned amplifier for 19kHz and as an impedance changer to match the signal supplied to the switching circuit (IC Q21). The primary winding of the collector load of Q17 is tuned to 19kHz, the secondary winding is connected to the full-wave rectifiers D14, D15.

The 19kHz pilot carrier is converted into a 38kHz ripple current of double frequency. Q20 operates as a class B amplifier for this 38kHz ripple signal, and a 38kHz tuned transformer eliminates harmonics from the 38kHz ripple to obtain a clean sine wave for switching L and R. The Q19 circuit

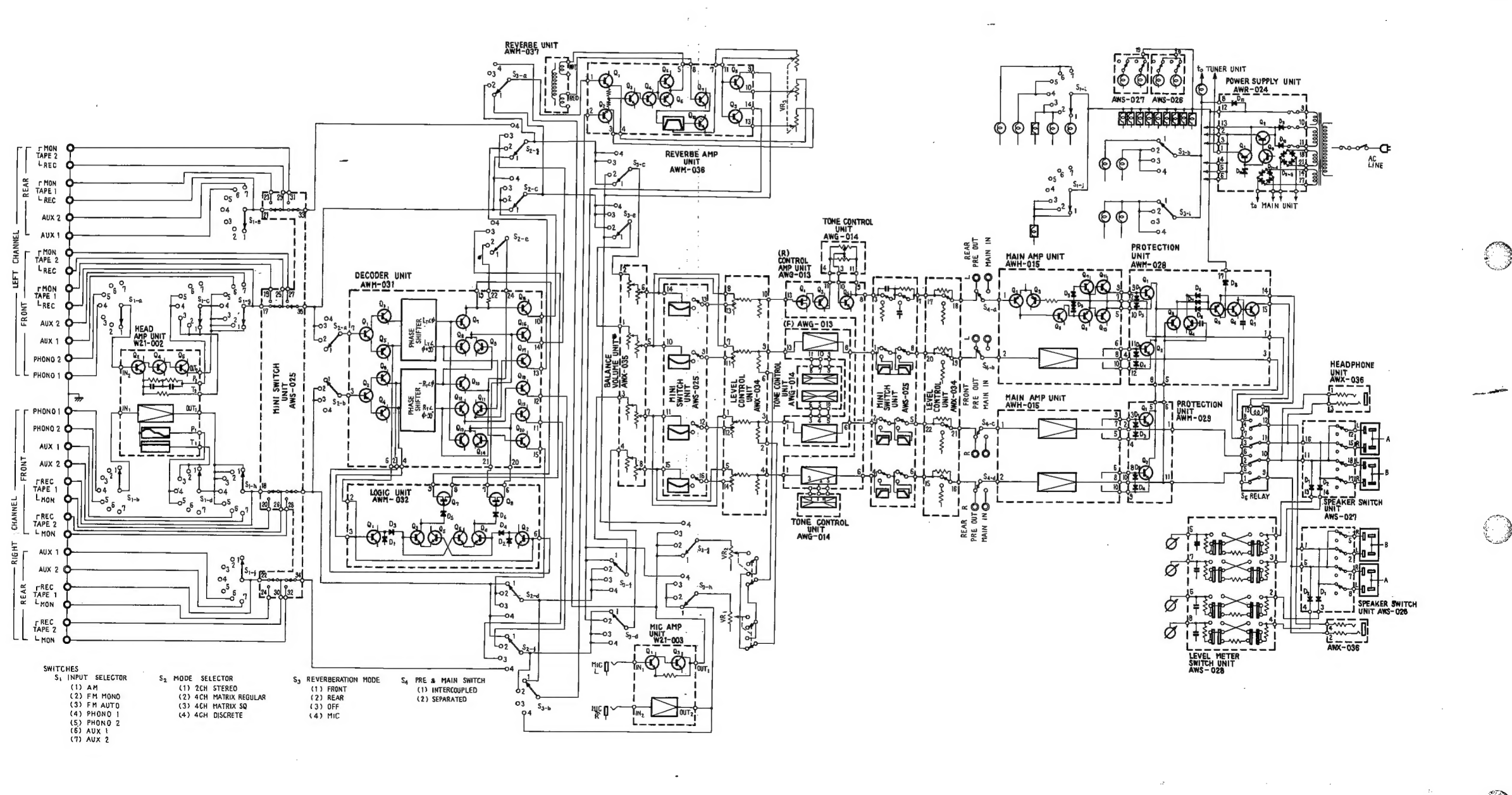
#### • AM Tuner Circuit

The AM tuner section consists of one RF amplifier Q12, converter Q13, local oscillator Q15, IF amplifiers Q4 and Q5 (which also function in FM mode), and the AM-exclusive 455kHz IF transformer T5, and a detector.

Input to the IF amplifier stage Q4, Q5 is obtained from the sharp tuned ceramic filter CF4.

AGC voltage, taken from the secondary side of T5 through rectifier diode D11, is delivered as reverse AGC to Q5. The signal from the junction of Q4 and Q5 passes through DC amplifier Q14 and from there to Q12. The variable collector voltage from Q12 is returned to Q14 and, from there, to Q13, acting as secondary AGC, D10 is the signal detector, but also produces DC current for driving the signal strength meter.

When the function selector is set at FM position, the +B voltage to Q12, Q13, Q15 is cut off.





## AUDIO CIRCUITRY

### • Head Amplifier Section

The signal from PHONO jacks selected with the SELECTOR switch passes through a three-stage direct coupled equalizer amplifier which provides low- and high-range compensation in compliance with RIAA specifications.

### • Microphone Amplifier Section

The signal from MIC jacks are amplified with two-stage direct coupled amplifier which has flat frequency response. The output signal is mixed with the other program sources through the MIC MIXING control.

### • Control Amplifier Section

The signals from the head amplifier, TAPE MON jack, AUX jack, or decoder section passes to VOLUME and BALANCE control, and to the control amplifier. The control amplifier consists of FET and PNP transistor in a direct coupled configuration, along with a negative feedback tone control stage consisting of one transistor.

A large amount of negative feedback is applied in the direct coupled amplifier to insure a high degree of stability and high input impedance. Low and high emphasis and attenuation are effected by changing the degree of feedback (with a potentiometer). Output of the control amplifier section passes to low-pass and high-pass filters and audio muting, and to main amplifier input.

### • Main Amplifier Section

Signals from the control amplifier section are fed to the main amplifier circuits. PNP and NPN transistor pairs are used in the final output stages, providing completely complementary circuits. Supply power is balanced, eliminating the need for output capacitors.

Initial input stages are of the differential amplifier type, allowing perfect control of the output terminal potential at zero. Adjustment of the neutral point is effected with a potentiometer at the input of the differential amplifier. Adjustment of the idling current level for the power transistors is effected with a variable resistor in the collector circuit of the second stage. Temperature compensation is handled by a diode assembly connected in series with the variable resistor.

Output passes through contacts of the protective relay, and the speaker switch, and appears at the speaker connector terminals. Signals for level meter drive are derived from a part of the output rectified by diode and are fed to a voltage dividing circuit.

### • Protection Circuit

The protective circuit consists of a stage for detecting the final amplifier stage current, a stage for detecting the drift voltage, and a relay drive stage.

There are four final amplifier current detecting circuits, one for each of the channels. Reference for these circuits is taken from the emitter stabilizing resistor in each case. When the voltage across this resistor rises beyond a certain point (as the result of an output short or excessive input), the relay in the output of the detector operates, thereby isolating the channel output terminal from the amplifier. Output terminal drift voltage is detected with a differential amplifier. One of the bases of the differential amplifier transistors is connected directly to the output terminal, while the other base is connected through capacitance. When DC voltage appears at an output terminal, a difference in base potentials arises, causing output of the differential amplifier. This output drives the relay drive circuit.

The relay drive circuit consists of three transistors. AC derived from the power supply is rectified by a diode and applied to the junction between the first and second transistors. With this arrangement, the relay is dropped immediately upon removal of AC power, thereby isolating the speaker output from the amplifier. A charge and discharge circuit (capacitance and resistance) is connected to the junction between the second and third transistors, creating delay in operation of the relay. This arrangement keeps the output terminals isolated for the length of time required for relay recovery and during the filter capacitor charging period following application of AC power.



# ALIGNMENT PROCEDURE

The following alignments are required only in very rare cases and should never be attempted without the proper test equipment. Also, only non-metallic tools must be used.

## 10.1 REQUIRED INSTRUMENTS

- Sweep generator: Center marker frequencies 10.7MHz, 455kHz
- Oscilloscope
- AC VTVM
- AM/FM signal generator
- FM multiplex signal generator, preferably with RF output

## 10.2 FM 10.7 MHz ALIGNMENT

1. Confirm +B voltage and current for 12V  $\pm 1V$  which should be 46mA to 50mA at pin 4 of FM/AM unit.
2. Disconnect leads from pins 22 (input) and 24, then connect resistor 2.2k $\Omega$  as shunted to pin 24 of FM/AM unit.
3. Connect 10.7MHz sweep generator to pins 22 (hot) and 23 (ground) of FM/AM unit. Set controls as follows:  
Center frequency: 10.7MHz  
Output: 55dB (500 $\mu$ V)
4. Connect vertical scope input to pin 24.
5. Align core of T1 for maximum gain and symmetry to obtain scope pattern as in Fig. 4.
6. Raise generator output gradually to 80dB (10mV), repeat step 5 realignment for each output level, if necessary.
7. Disconnect one side of C23. Disconnect oscilloscope and resistor 2.2k $\Omega$  from pin 24. Then reconnect lead to pin 24.
8. Connect scope input to pin 9.
9. Set generator output back to 55dB (500 $\mu$ V).
10. Adjust bottom core of T2 for maximum gain and linearity.  
Adjust top core so that center frequency mark is located on zero-axis, as shown in Fig. 5.
11. Reconnect C23.
12. Reconnect input lead to pin 22.

## 10.3 FM FRONT END ALIGNMENT

1. Confirm +B current (drain 11mA $\pm$ 4mA).
2. Connect FM signal generator output to 300 $\Omega$  antenna input.
3. Connect AC VTVM to TAPE REC jack on rear panel.
4. Adjust generator for 400Hz, 100% modulation.
5. Set SELECTOR switch on front panel to FM MONO.

6. Adjust generator frequency and tuning dial to 90MHz.

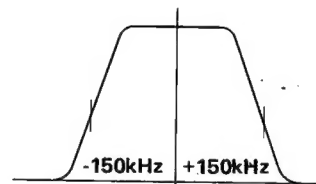
During the following adjustments, keep the generator output as low as possible.

7. Adjust L4 core first, then adjust cores of L1, L2, L3 for maximum reading on VTVM and so that tuning meter indicates center position (Fig. 6).
8. Set generator frequency and tuning dial to 106MHz.
9. Adjust trimmer capacitor CT4 first, then adjust CT1, CT2, CT3 for maximum reading on VTVM.
10. Repeat these alignments a few times until satisfactory reading is obtained.
11. Finally, adjust T1 core for maximum reading on VTVM.

## 10.4 FM MPX DECODER ALIGNMENT

1. Set SELECTOR switch on front panel to FM AUTO.
2. Connect RF output of FM multiplex signal generator to 300 $\Omega$  antenna input.
3. Adjust MPX generator as follows:

Signal Mode	Deviation
L+R	40.5kHz
19kHz (pilot)	7.5kHz
4. Connect AC VTVM to TAPE REC jack on rear panel.
5. Set generator signal mode to L-R (sub), adjust core of T6 (located on FM/AM unit) to obtain maximum reading on VTVM.
6. Set generator signal mode to L. Adjust VR2 (located on FM/AM unit) for minimum crosstalk on R channel TAPE REC output.
7. Set generator signal mode to R. Repeat above adjustment for minimum crosstalk on L channel.



CENTER FREQUENCY 10.7MHz Fig. 4

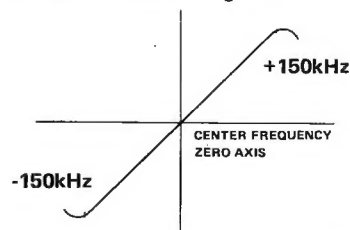


Fig. 5

### 10.5 MUTING THRESHOLD LEVEL ALIGNMENT

1. Set SELECTOR switch to FM MONO.
2. Turn FM MUTING switch to ON.
3. Connect FM signal generator to 300 $\Omega$  antenna input.
4. Connect AC VTVM to TAPE REC jack.
5. Set output level of generator to 25dB (20 $\mu$ V), with  $\pm 22.5$ kHz deviation, and 400Hz or 1kHz modulation.
6. Tune receiver accurately to generator frequency.
7. Adjust VR1 on FM/AM unit exactly on the borderline between muting and non-muting.

### 10.6 AM 455kHz ALIGNMENT

1. Set SELECTOR switch on front panel to AM.
2. Connect 455kHz sweep generator to pin 15. Adjust generator output level to 60dB (1mV).
3. Connect vertical oscilloscope input to either L or R of TAPE REC jack.
4. Set tuning dial to high end position.
5. Adjust cores of CF4 and T5 for maximum gain and symmetrical pattern on oscilloscope.

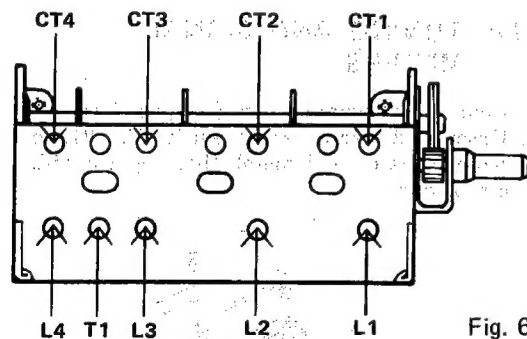


Fig. 6

### 10.7 AM TRACKING ALIGNMENT

1. Set SELECTOR switch to AM position.
2. For this alignment, bottom plate must be installed.
3. Set signal generator to AM function, 30% modulation with 400Hz. Connect loop antenna to generator RF output and place near receiver's ferrite antenna. See Fig. 7.
4. Connect VTVM to TAPE REC jack.
5. Keep generator as low as possible for minimum VTVM reading.
6. Tune generator and receiver to 600kHz. Adjust core of T4 on FM/AM unit for maximum VTVM reading, then adjust core of T3 and ferrite antenna.
7. Re-tune generator and receiver to 1,400kHz.
8. Adjust trimmers of tuning capacitor indicated in Fig. 8 to obtain maximum VTVM reading.

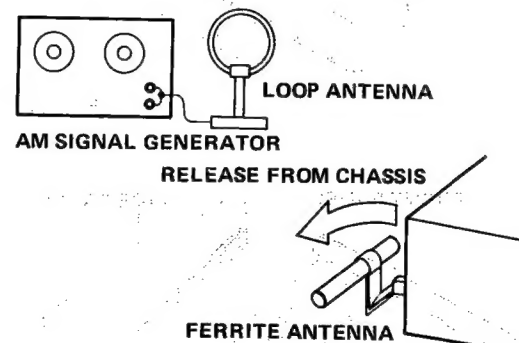
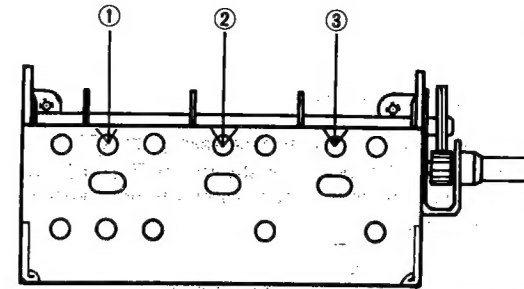


Fig. 7



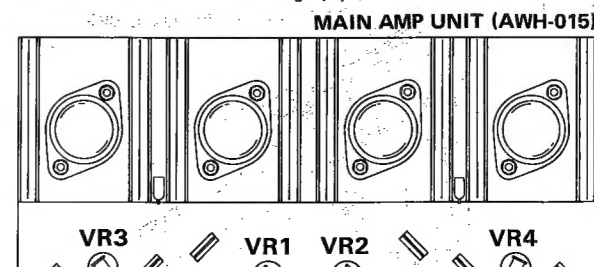
• NUMBERS INDICATE ORDER OF ALIGNMENTS

Fig. 8

### 10.8 IDLE CURRENT ADJUSTMENT

- Set all controls as follows:  
 SPEAKER switches ..... OFF  
 POWER switch ..... OFF  
 BASS and TREBLE controls ..... center position  
 LOW and HIGH FILTER switches OFF  
 AUDIO MUTING switch ..... OFF  
 LOUDNESS switches ..... OFF  
 VOLUME control ..... MIN  
 TAPE MON switches ..... OFF  
 SELECTOR switch ..... AUX 1  
 MODE switch ..... DISCRETE  
 BALANCE controls ..... center position  
 REVERB MODEL switch ..... OFF  
 MIC MIXING controls ..... OFF  
 METER LEVEL switches ..... OFF  
 Then:

- Connect AC power cord to AC outlet.
  - Set POWER switch to ON.
  - Allow a few minutes for amplifier to warm up.
- Set voltmeter near 0.1V full scale range, connect between pins 5 and 9 on PCB AWH-015.
  - Adjust VR3 to obtain meter reading of 20 ~ 60mV.
  - Connect voltmeter pins 6 and 10.
  - Adjust VR4 as in step (c).



### 10.9 DC NEUTRAL VOLTAGE ADJUSTMENT

- Set all controls as in 10.8 (a).
- Observe relay located at top of chassis. Turn power on. Relay should be activated, without chattering, about 3 ~ 8 seconds later.
- Connect voltmeter between pins 7 and 13 on PCB AWH-015.
- Adjust VR1 on power amplifier for 0V meter reading.
- Connect voltmeter between pins 8 and 13.
- Adjust VR2 as in step (d).

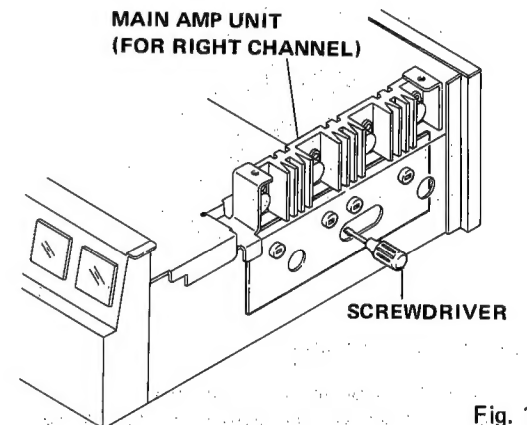


Fig. 10

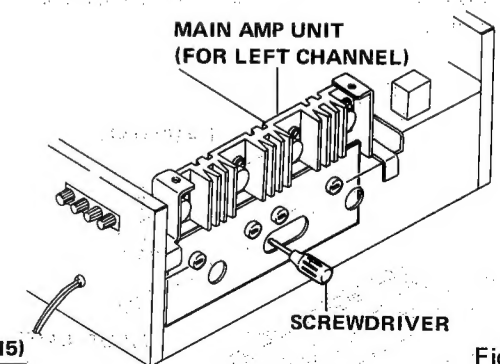
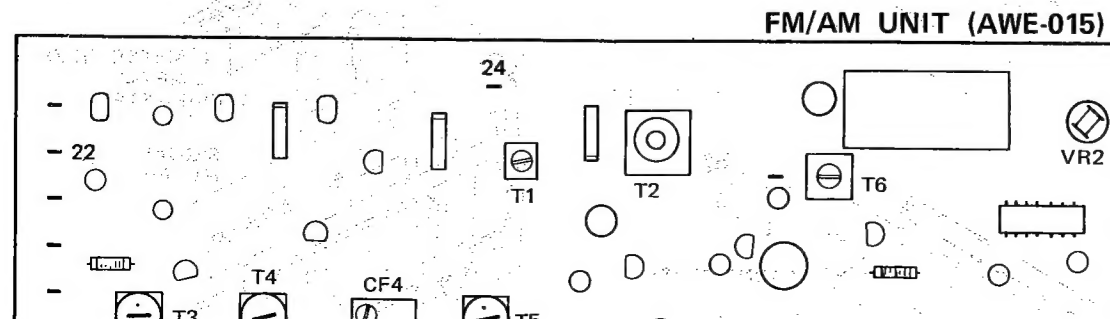


Fig. 11



## 11. PARTS REPLACEMENT

### 11.1 PILOT LAMPS

#### ● Lamps Used for Speaker Switches

1. Remove the front panel (see page 15).
2. Pull off the speaker switches while turning the switches (protruding) ON.
3. Pull off the lamps and replace with new ones.

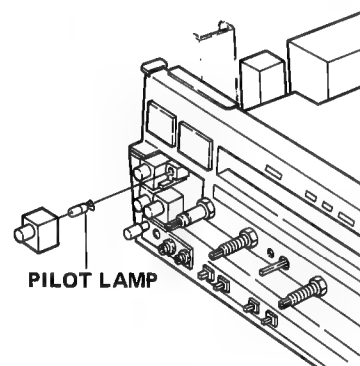
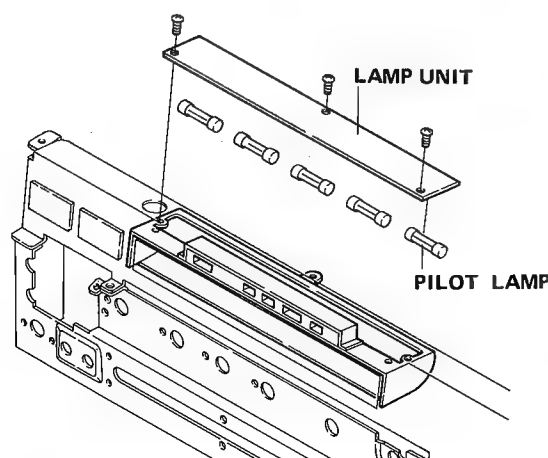


Fig. 13

#### ● Dial Indicating Lamps

1. Remove the wooden case (see page 15).
2. Unscrew 3 screws, as shown in Fig. 14, to remove the lamp unit, then replace with a new one.



#### ● Level Meter Lamps

1. Remove the wooden case (see page 15).
2. Unscrew 2 screws, as shown in Fig. 15, to remove the lamp unit, then replace with a new one.

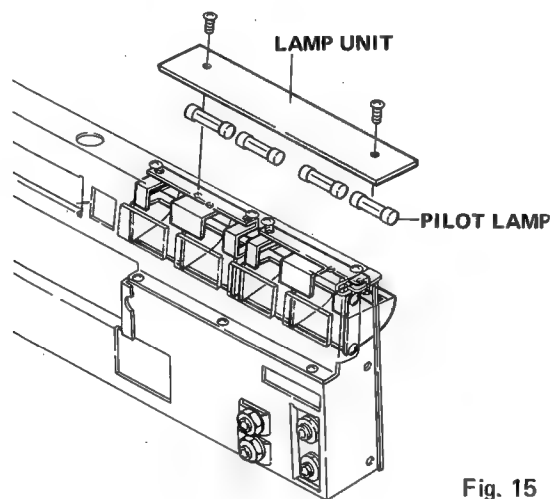
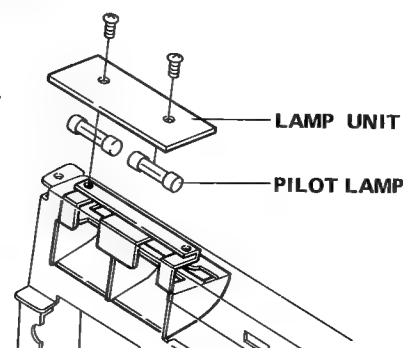


Fig. 15

#### ● Signal and Tuning Meter Lamps

1. Remove the wooden case (see page 15).
2. Unscrew 2 screws, as shown in Fig. 16, to remove the lamp unit, then replace with a new one.



### 11.2 FRONT GLASS

1. Remove the front panel (see page 15).
2. Remove the side panel attached to the front panel. To protect the side panel use a rubber hammer. The panel will be removed without being impaired.
3. Take the front glass away from its bezels by moving it sideways, then replace with a new one.
4. After inserting new front glass into the bezels, set the side panel in place. If the side panel wobbles, apply bonding agent (for metal bonding use) to stop wobbling.

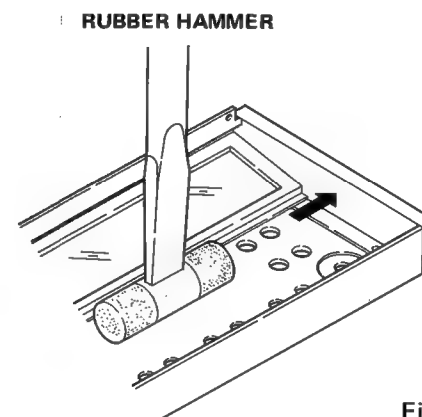


Fig. 17

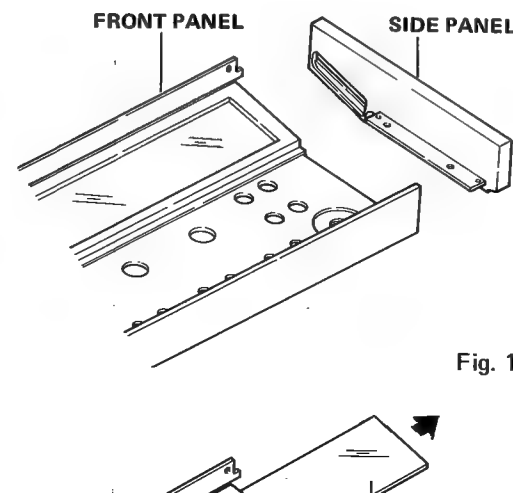


Fig. 18

### 11.3 LEVEL METERS

1. Remove the wooden case (see page 15).
2. Unscrew 2 screws fastening the lamp unit to remove it.
3. Unscrew 2 screws, as shown in Fig. 20, to remove meter-held metal, then replace with a new one.

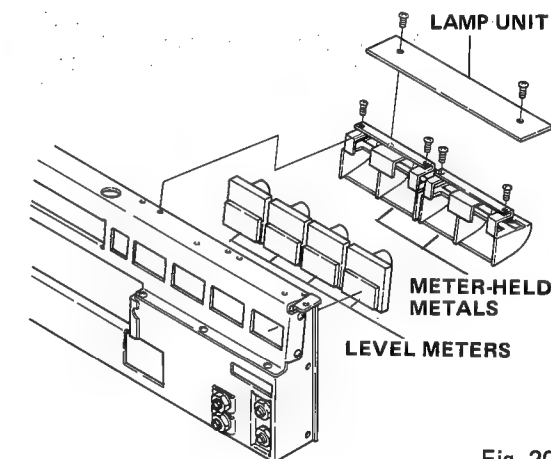
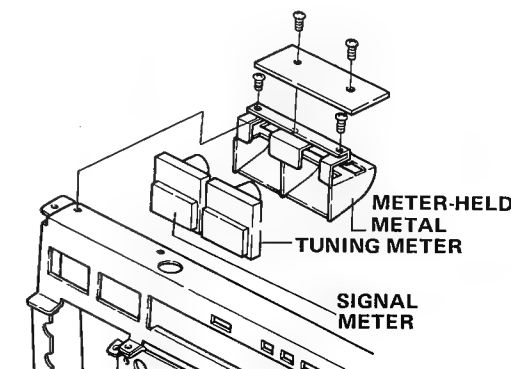


Fig. 20

### 11.4 TUNING AND SIGNAL METERS

1. Remove the wooden case (see page 15).
2. Unscrew 2 screws, as shown in Fig. 21, to remove meter-held metal, then replace with a new one.



## MUTING THRESHOLD LEVEL ALIGNMENT

1. Set SELECTOR switch to FM MONO.
2. Set FM MUTING switch to ON.
3. Connect FM signal generator to 300 $\Omega$  antenna input.
4. Connect AC VTVM to TAPE REC jack.
5. Set output level of generator to 25dB (20 $\mu$ V), with  $\pm 22.5$ kHz deviation, and 400Hz or 1kHz modulation.
6. Tune receiver accurately to generator frequency.
7. Adjust VR1 on FM/AM unit exactly on the borderline between muting and non-muting.

## 10.6 AM 455kHz ALIGNMENT

1. Set SELECTOR switch on front panel to AM.
2. Connect 455kHz sweep generator to pin 15. Adjust generator output level to 60dB (1mV).
3. Connect vertical oscilloscope input to either L or R of TAPE REC jack.
4. Set tuning dial to high end position.
5. Adjust cores of CT4 and T5 for maximum gain and symmetrical pattern on oscilloscope.

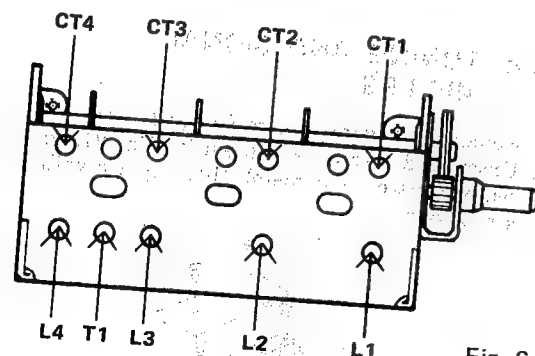


Fig. 6

## 10.7 AM TRACKING ALIGNMENT

1. Set SELECTOR switch to AM position.
2. For this alignment, bottom plate must be installed.
3. Set signal generator to AM function, 30% modulation with 400Hz. Connect loop antenna to generator RF output and place near receiver's ferrite antenna. See Fig. 7.
4. Connect VTVM to TAPE REC jack.
5. Keep generator as low as possible for minimum VTVM reading.
6. Tune generator and receiver to 600kHz. Adjust core of T4 on FM/AM unit for maximum VTVM reading, then adjust core of T3 and ferrite antenna.
7. Re-tune generator and receiver to 1,400kHz.
8. Adjust trimmers of tuning capacitor indicated in Fig. 8 to obtain maximum VTVM reading.

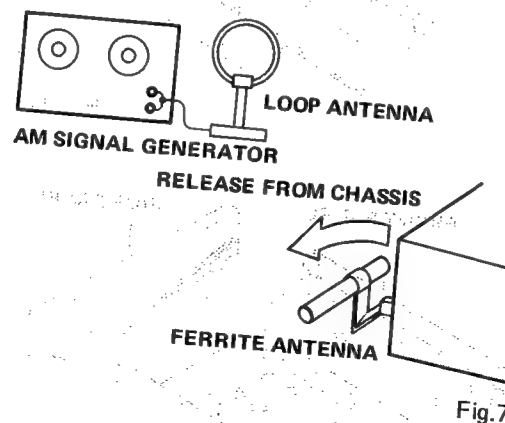
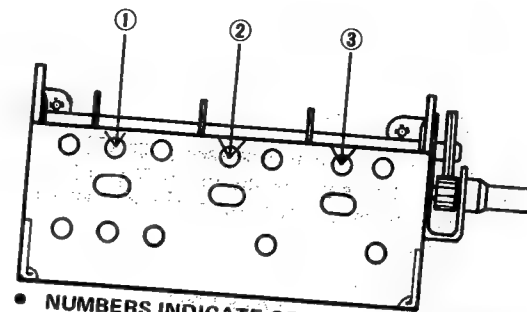


Fig. 7



NUMBERS INDICATE ORDER OF ALIGNMENTS

Fig. 8

## 10.8 IDLE CURRENT ADJUSTMENT

- Set all controls as follows:
 

SPEAKER switches	OFF
POWER switch	OFF
BASS and TREBLE controls	center position
LOW and HIGH FILTER switches	OFF
AUDIO MUTING switch	OFF
LOUDNESS switches	OFF
VOLUME control	MIN
TAPE MON switches	OFF
SELECTOR switch	AUX 1
MODE switch	DISCRETE
BALANCE controls	center position
REVERB MODEL switch	OFF
MIC MIXING controls	OFF
METER LEVEL switches	OFF

Then:

- Connect AC power cord to AC outlet.
  - Set POWER switch to ON.
  - Allow a few minutes for amplifier to warm up.
- Set voltmeter near 0.1V full scale range, connect between pins 5 and 9 on PCB AWH-015.
  - Adjust VR3 to obtain meter reading of 20 ~ 60mV.
  - Connect voltmeter pins 6 and 10.
  - Adjust VR4 as in step (c).



## QX-9900

## 10.9 DC NEUTRAL VOLTAGE ADJUSTMENT

- Set all controls as in 10.8 (a).
- Observe relay located at top of chassis. Turn power on. Relay should be activated, without chattering, about 3 ~ 8 seconds later.
- Connect voltmeter between pins 7 and 13 on PCB AWH-015.
- Adjust VR1 on power amplifier for 0V meter reading.
- Connect voltmeter between pins 8 and 13.
- Adjust VR2 as in step (d).

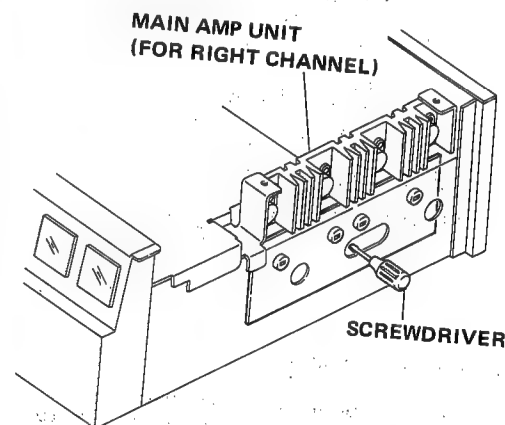


Fig. 10

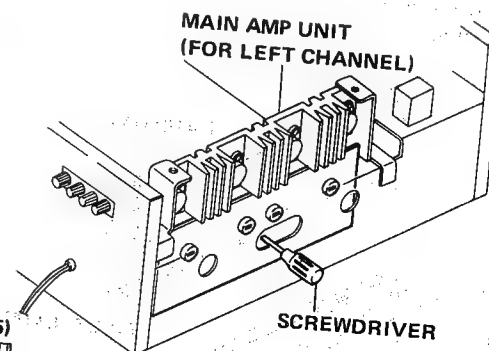
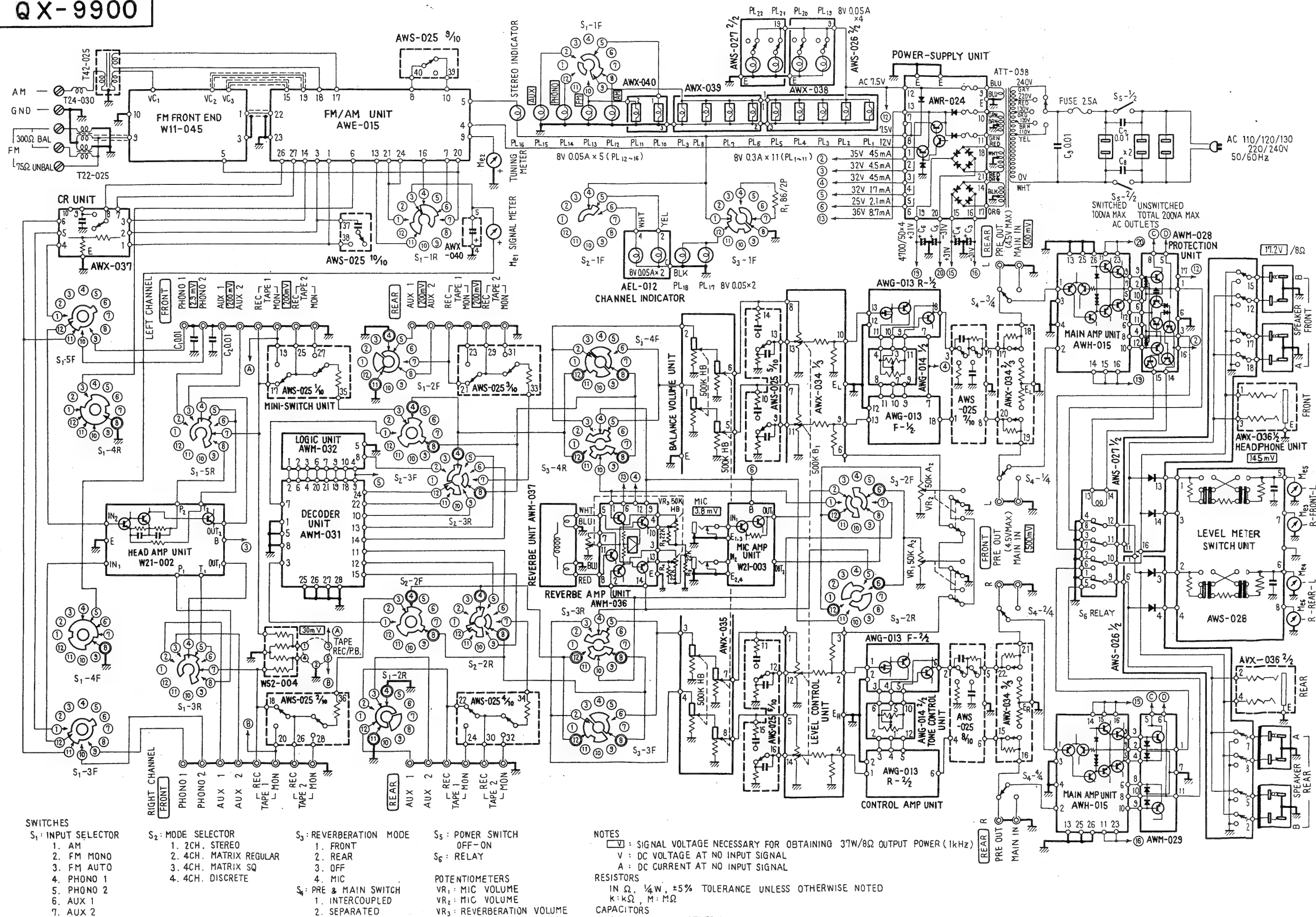


Fig. 11



# QX-9900



SS OTHERWISE NOTED. p: pF.  
ESS OTHERWISE NOTED. k: kΩ, M: MΩ.

in		Part No.	
11	25V	CKDYF 103Z 25	
11	25V	CKDYF 103Z 25	
00	50V	ACH-016-A	
00	50V	ACH-016-A	
00	50V	ACH-016-A	
00	50V	ACH-016-A	
11	250V	ACG-001-O	
11	250V	ACG-001-O	
11	250V	ACG-001-O	

in		Part No.	
	2W	RS2P 860K	
<		RD¼PS 223J	
<		RD¼PS 223J	
<		RD¼PS 223J	
control		C85-056-B	
control		C85-056-B	
erberation time		ACV-506-A	

SWITCHES

Symbol	Description	Part No.	
S1	Selector switch	ASC-032-O	
S2	Mode switch	ASC-034-O	
S3	Reverberation mode switch	ASC-033-O	
S4	Pre and main switch	S41-025-O	
S5	Power switch	ASG-003-O	
S6	Relay	ASR-003-O	

COILS AND TRANSFORMERS

Symbol	Description	Part No.	
	Power transformer	ATT-098-A	
	AM ferrite loopstick antenna	T42-025-O	
	Choke coil	T24-030-O	
	Balune	T22-025-A	

in		Part No.	
		W11-045-O	
		AWE-015-B	
		W21-002-B	
		W21-003-A	
		AWG-013-O	
		AWG-014-O	
		AWH-015-B	
		AWM-028-O	
		AWM-029-O	
		AWM-031-O	
		AWM-032-A	
		AWM-036-O	
		AWM-037-A	
		AWR-024-B	
		AWS-025-O	
A		AWS-026-O	
B		AWS-027-O	
init		AWS-028-O	
		AWX-034-A	
		AWX-035-O	
		AWX-036-O	
		AWX-037-O	
		AWX-038-O	
		AWX-039-O	
		AWX-040-O	
		ANB-155-C	
		ANB-156-A	
		AMM-021-A	
		AXA-016-O	
		AEC-027-B	

Symbol	Description	Part No.	
	Tuning pulley	AXA-015-O	
	AM ferrite loopstick antenna		
	holder ass'y	W72-092-B	
	Dial scale	AAG-038-B	
	Signal meter	AAW-011-O	
	Tuning meter	AAW-012-O	
	Level meter	AAW-013-O	
	Knob (TUNING)	AAA-014-O	
	Knob (VOLUME)	AAB-037-O	
	Knob (BALANCE)	AAB-025-O	
	Knob (MIC MIXING)	AAB-030-O	
	Knob (SELECTOR, MODE, and REVERB MODE)	AAB-035-O	
	Knob (REVERB TIME)	AAB-036-A	
	Knob (BASS and TREBLE-FRONT)	AAC-023-A	
	Knob (BASS and TREBLE-REAR)	AAC-024-O	
	Knob (PUSH SWITCH)	AAD-036-A	
	Knob (POWER)	AAD-037-O	
	Knob (AUDIO MUTING)	AAD-038-O	
	Knob (SPEAKER SWITCH A ass'y)	AAE-001-A	
	Knob (SPEAKER SWITCH B ass'y)	AAE-002-A	
	Dial pointer	AAF-024-A	
	Reverberation time indicator A	AAN-001-O	
	Reverberation time indicator B	AAN-001-O	
	Channel indicator	AEL-012-O	
	Antenna input terminal board	K11-043-D	
	4P input terminal board	AKB-005-O	
	4P input terminal board (A)	AKB-010-O	
	4P input terminal board	AKB-012-O	
	Pilot lamp for program indicator	AEL-007-O	
	Pilot lamp for speaker switch	AEL-011-O	
	Fuse 2.5A	AEK-020-O	



## PARTS LIST OF EXPLODED VIEW-1

\* This parts lists is for the EXPLODED VIEW-1 on pages 31 and 32.

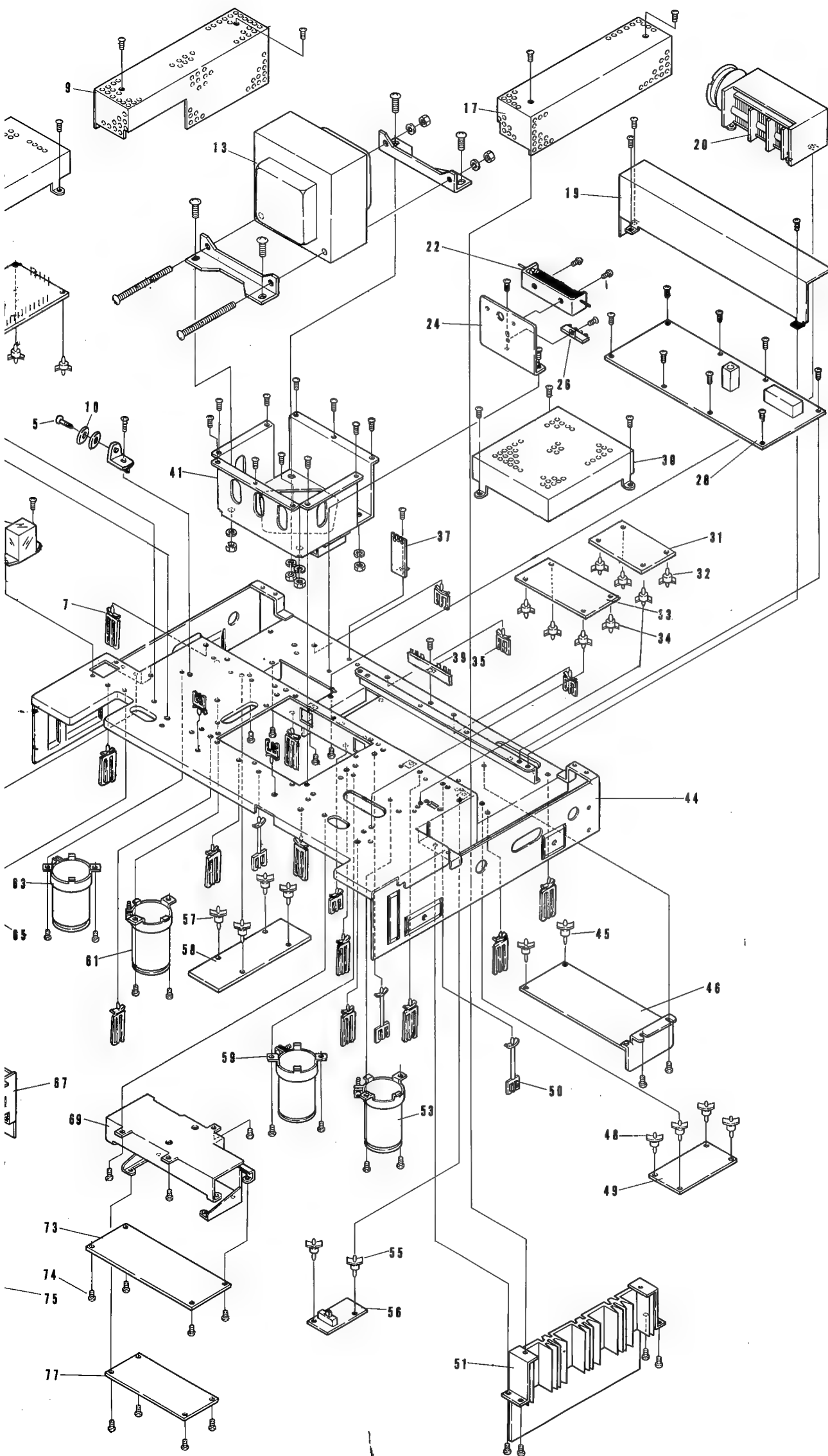
Symbol	Description	Part No.
	Pilot lamp for dial scale and meter	E22-032-O
	Compound part for REC jack	W52-004-O
	Microphone jack	K72-024-O
	Spare AC outlet	AKP-005-O
	Speaker socket	K72-028-O
	Line voltage selector	AKR-001-O
	5P connector socket (DIN)	K93-003-B
	Insulating spacer	E32-045-O
	Insulating washer	E34-004-O
	Screw for grounding	B11-012-A
	Speaker to fix bottom plate	ABA-012-O
	Insulating nut	B71-031-O
	Screw to fix wooden case	ABA-010-O
	AC power cord	ADG-002-O
	Operating instructions copy	ARB-065-O
	Polishing cloth	E33-009-B
	Speaker plug	K72-007-B
	Fuse 5A	AEK-021-O
	FM T-type antenna	D52-013-O
	Packing case (with printed code number)	AHD-119-A
	Packing case	AHD-120-Q
	Inside packing	AHC-003-B
	Side pad (L) ass'y	AHA-023-A
	Side pad (R) ass'y	AHA-024-A
	Top pad	AHB-010-A
	Accessory box	AHC-001-O

Key No.	Description	Part No.
1	Shield cover	ANH-102-O
2	Reverb amp unit	AWM-036-O
3	Boss	B21-008-A
4	Small pulleys shaft	M49-025-E
5		
6	Relay	ASR-003-O
7	Wire clip	AEC-063-O
8		
9	Main amp cover L	ANH-104-A
10	Small pulley	AEC-006-O
11		
12		
13	Power transformer	ATT-098-A
14		
15		
16		
17	Main amp cover R	ANH-105-B
18		
19	Shield cover	ANH-101-O
20	FM front end	W11-045-O
21		
22	Reverb unit	AWM-037-A
23		
24	Reverb unit-held metal	ANF-094-B
25		
26	4P lug terminal	AKC-016-O
27		
28	FM/AM unit	AWE-015-B
29		
30	Shield cover	ANH-103-A

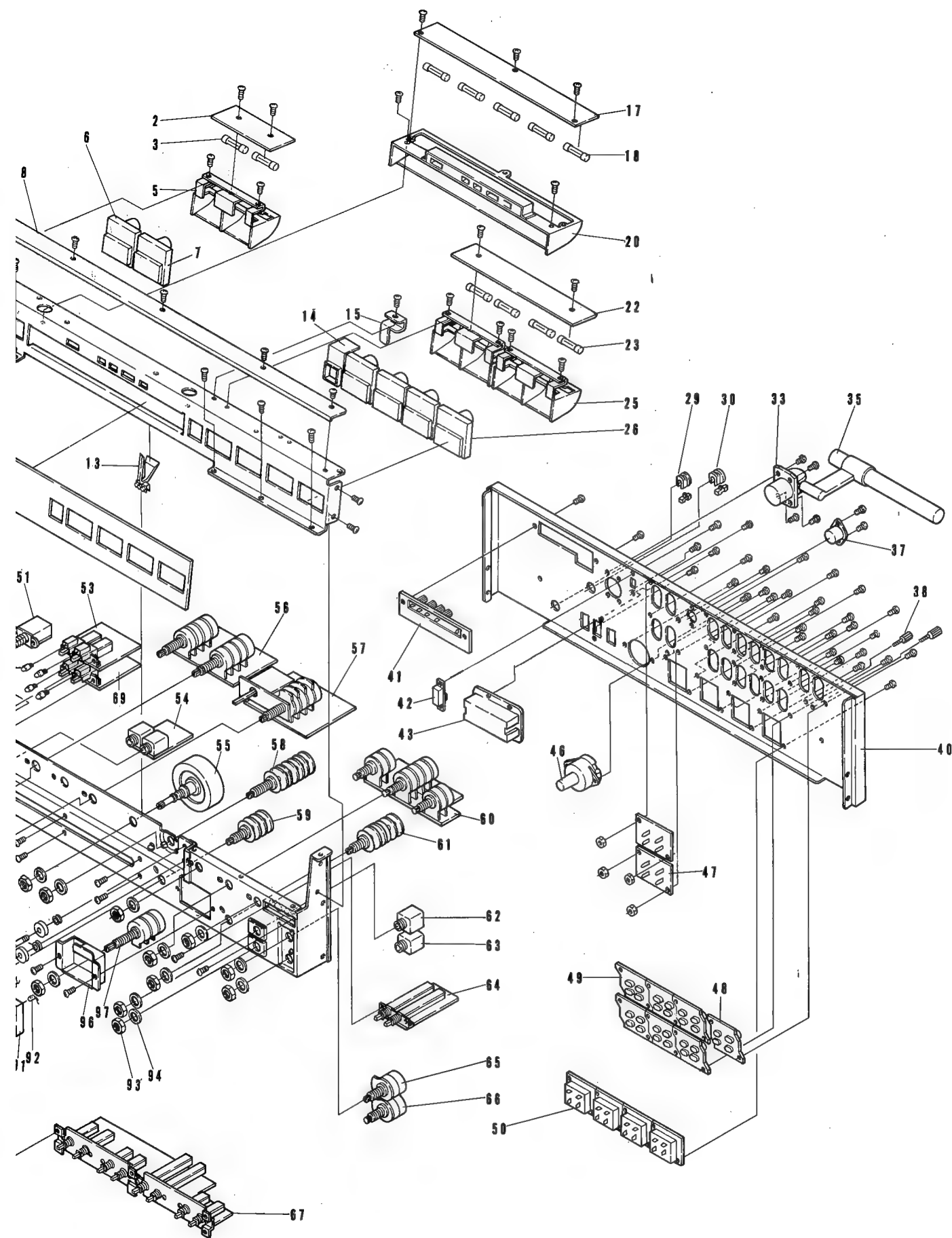
**EXPLODED VIEW-1**  
(continued)

Key No.	Description	Part No.
31	Mic amp unit	W21-003-A
32	Boss	B21-008-A
33	Head amp unit	W21-002-B
34	Boss	B21-008-A
35	Wire clip	AEC-004-0
36		
37	Wire clip	
38		
39	6 Plug terminal	AKC-017-0
40		
41	Sub chassis	ANA-030-B
42		
43		
44	Chassis	ANA-028-A
45	Boss	B21-008-A
46	Power supply unit	AWR-024-B
47		
48	Boss	B21-008-A
49	Protection unit	AWM-029-0
50	Wire clip	AEC-069-A
51	Main amp unit	AWH-015-B
52		
53	Electrolytic capacitor 4700 $\mu$ F 50V	ACH-016-A
54		
55	Boss	B21-008-A

Key No.	Description	Part No.
56	CR unit	AWX-037-0
57	Boss	B21-008-A
58	Protection unit	AWM-028-0
59	Electrolytic capacitor 4700 $\mu$ F 50V	ACH-016-A
60		
61	Electrolytic capacitor 4700 $\mu$ F 50V	ACH-016-A
62		
63	Electrolytic capacitor 4700 $\mu$ F 50V	ACH-016-A
64		
65	Main amp unit	AWH-015-B
66		
67	Unit-held metal	ANF-091-B
68		
69	Unit-held metal	ANF-092-B
70		
71	Control amp unit	AWG-013-0
72		
73	Decoder unit	AWM-031-0
74		
75	Control amp unit	AWG-013-0
76		
77	Logic unit	AWM-032-A



0066-XD



## PARTS LIST OF EXPLODED VIEW-2

Key No.	Description	Part No.	Key No.	Description	Part No.
1	Lamp holder unit (C)	AWX-040-0	31	AM ferrite loopstick antenna holder ass'y	W72-092-B
2	Pilot lamp	E22-032-0	32		
3			33		
4			34	AM ferrite loopstick antenna	T42-025-0
5	Meter-held metal	ANH-107-A	35		
6	Signal meter	AAW-011-0	36		
7	Tuning meter	AAW-012-0	37	5P connector socket (DIN)	K93-003-B
8	Dial scale-held metal	ANK-027-0	38	Screw for grounding	B11-012-A
9			39		
10			40	Rear panel	ANC-063-A
11	Dial back panel	AND-046-0	41	Antenna input terminal board	K11-043-D
12	Dial scale	AAG-038-B	42	Pre & main switch	S41-025-0
13	Dial pointer	AAF-024-A	43	Spare AC outlet	AKP-005-0
14	Channel indicator	AEL-012-0	44		
15	Indicator panel-held metal	ANF-090-0	45		
16			46	Line voltage selector	AKR-001-0
17	Lamp holder unit (A)	AWX-038-0	47	4P input terminal board	AKB-012-0
18	Pilot lamp	E22-032-0	48	4P input terminal board (A)	AKB-010-0
19			49	4P input terminal board	AKB-005-0
20	Lamp box	ANH-106-A	50	Speaker socket	K72-028-0
21			51	Power switch	ASG-003-0
22	Lamp holder unit (B)	AWX-039-0	52	Pilot lamp for speaker switch	AEL-011-0
23	Pilot lamp	E22-032-0	53	Speaker switch unit (B)	AWS-027-0
24			54	Headphone unit	AWX-036-0
25	Meter-held metal	ANH-107-A	55	Tuning shaft ass'y	ASX-016-0
26	Level meter	AAW-013-0			
27					
28					
29	AC cord stopper	AEC-032-0			
30	AC cord stopper	E32-056-0			

# EXPLODED VIEW-2 (continued)

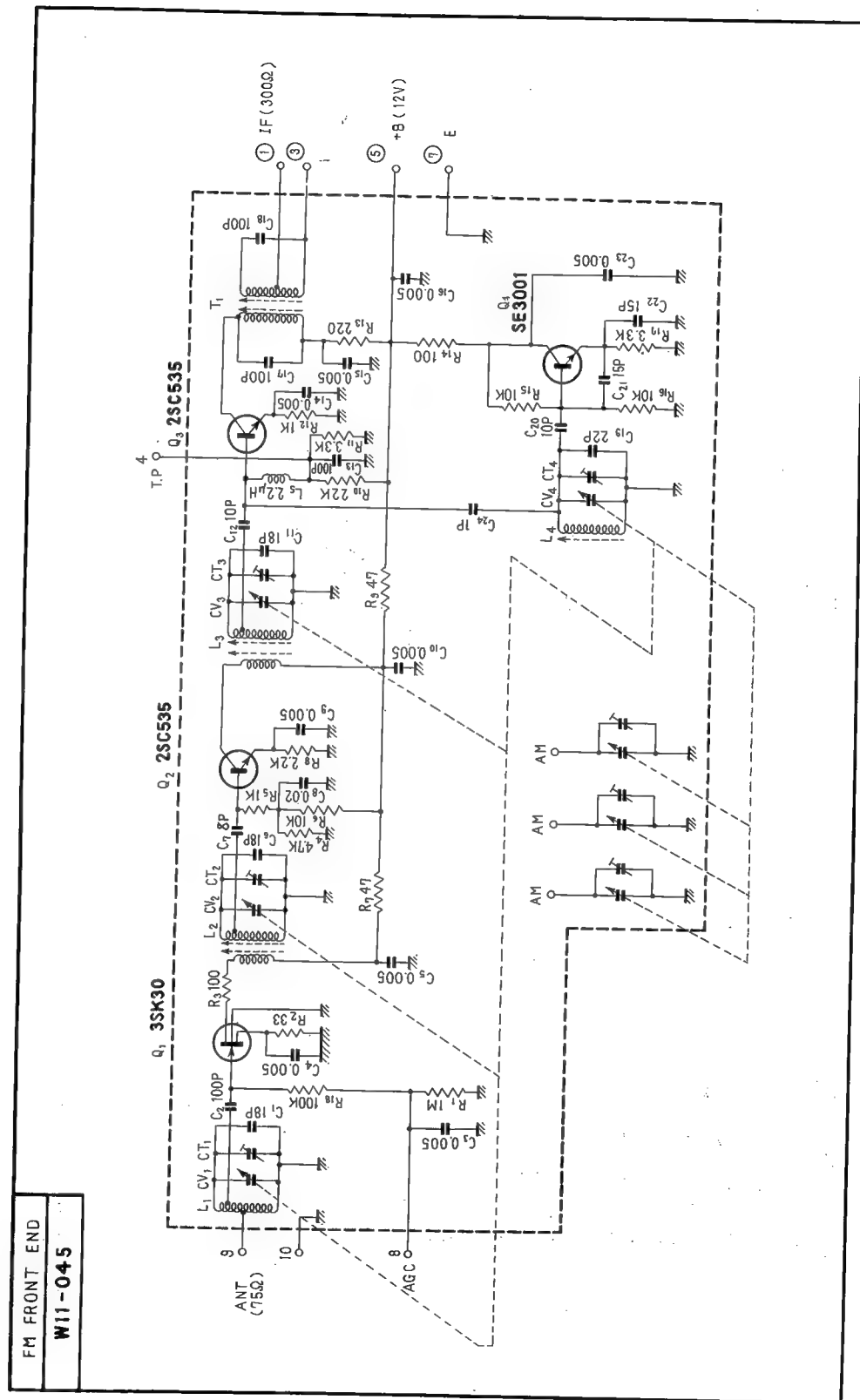
36

Key No.	Description	Part No.
56	Tone control unit	AWG-014-0
57	Level control unit	AWX-034-0
58	Selector switch	ASC-032-0
59	Mode switch	ASC-034-0
60	Balance volume unit	AWX-035-0
61	Reverberation mode switch	ASC-033-0
62	Microphone jack	K72-024-0
63	Microphone jack	K72-024-0
64	Level meter switch unit	AWS-028-0
65	Mic mixing control	C82-056-B
66	Mic mixing control	C82-056-B
67	Mini-switch unit	AWS-025-0
68	Dial stay	AND-045-B
69	Speaker switch unit (A)	AWS-026-0
70	Small pulley	AEC-017-0
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		

Key No.	Description	Part No.
81		
82		
83	Screw for small pulley	M49-025-E
84	Pulley	AEC-006-0
85	Screw for small pulley	M49-025-E
86		
87		
88	Reverberation time indicator B	AAAN-002-0
89	Washer	ABF-003-0
90	Reverberation time indicator A	AAAN-001-0
91	Cushion rubber	AEB-021-A
92	Pilot lamp for reverberation indicator	AEL-007-0
93	Insulating nut	B71-031-0
94	Insulator washer	E34-004-0
95		
96	Shaft-held metal	ANF-089-0
97	Reverberation time control	ACV-506-A



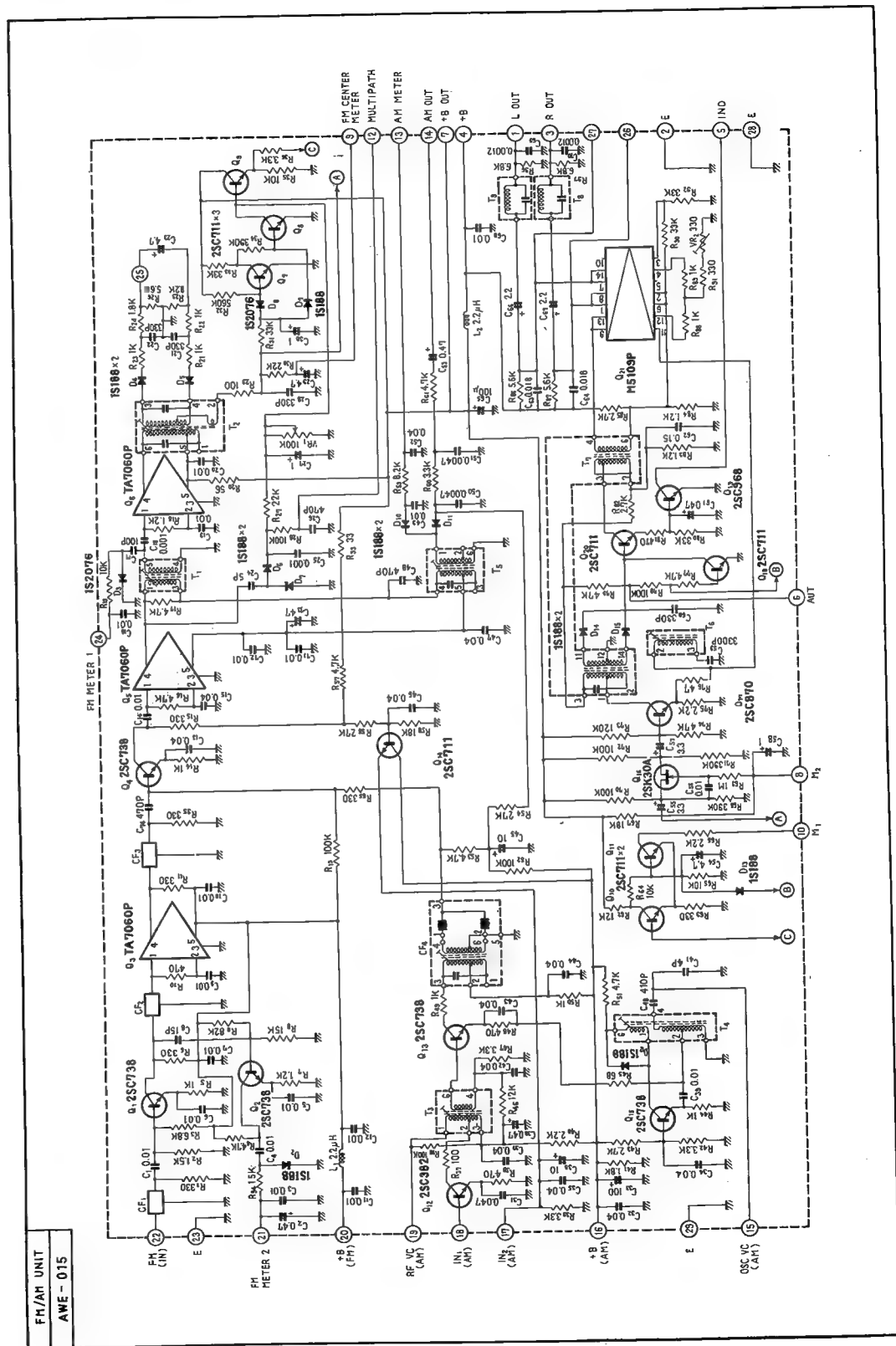
12.2 FM FRONT END (W11-045-0)

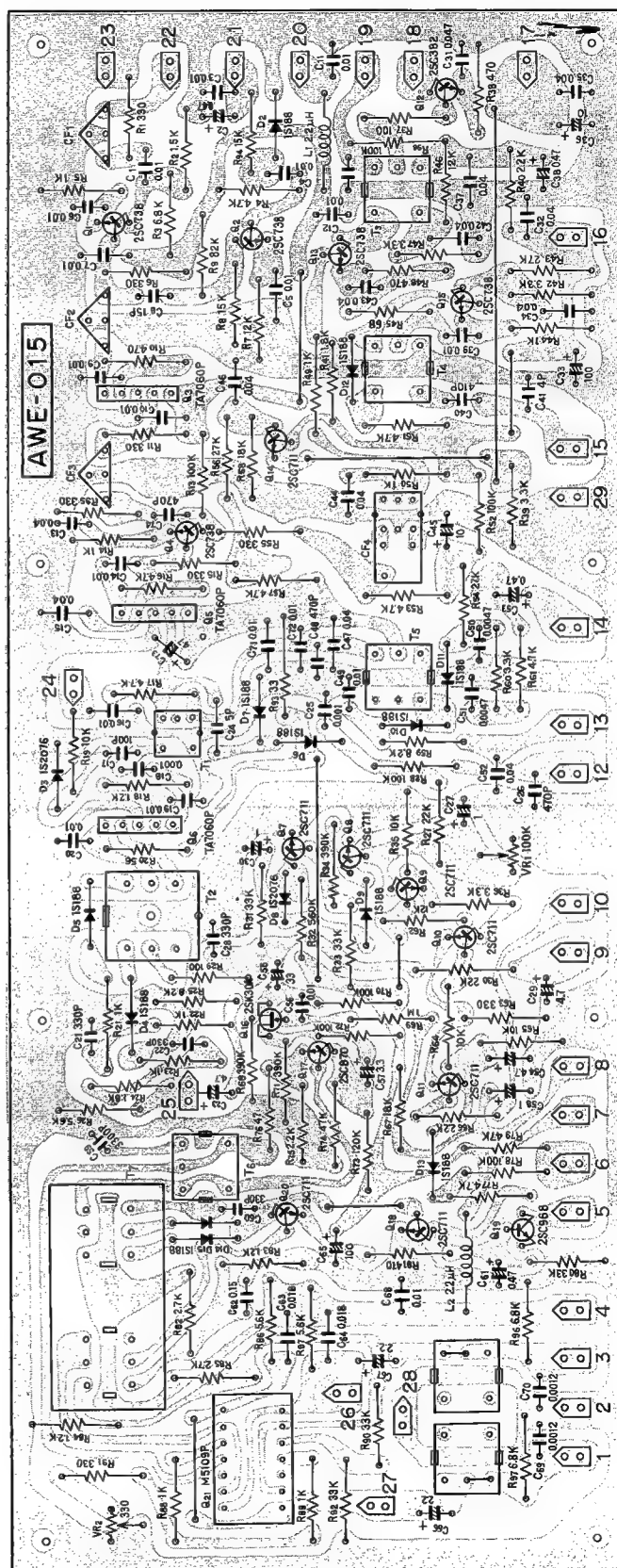


FM FRONT END

W11-045

## 12.3 FM/AM UNIT (AWE-015-B)





# 40 PARTS LIST OF FM/AM UNIT

## CAPACITORS

Symbol	Description	Part No.
C1	Ceramic	CKDYF 103Z 50
C2	Electrolytic	CEA R47P 50
C3	Ceramic	CKDYF 103Z 50
C4	Ceramic	CKDYF 103Z 50
C5	Ceramic	CKDYF 103Z 50
C6	Ceramic	CKDYF 103Z 50
C7	Ceramic	CKDYB 103K 50
C8	Ceramic	CCDSL 150K 50
C9	Ceramic	CKDYF 103Z 50
C10	Ceramic	CKDYB 103K 50
C11	Ceramic	CKDYF 103Z 50
C12	Ceramic	CKDYB 103K 50
C13	Ceramic	CKDYF 403Z 50
C14	Ceramic	CKDYF 103Z 50
C15	Ceramic	CKDYF 403Z 50
C16	Ceramic	CKDYF 103Z 50
C17	Ceramic	CCDSL 101K 50
C18	Ceramic	CKDYB 102K 50
C19	Ceramic	CKDYF 103Z 50
C20	Ceramic	CKDYF 103Z 50
C21	Ceramic	CKDYB 331K 50
C22	Ceramic	CKDYB 331K 50
C23	Electrolytic	CEA 4R7P 25
C24	Ceramic	CCDSL 050D 50
C25	Ceramic	CKDYB 102K 50

Symbol	Description	Part No.
C26	Ceramic	CKDYB 471K 50
C27	Electrolytic	CEA 010P 50
C28	Ceramic	CKDYB 331K 50
C29	Electrolytic	CEA 4R7P 25
C30	Electrolytic	CEA 010P 50
C31	Ceramic	CKDBC 473Z 25
C32	Ceramic	CKDYF 403Z 50
C33	Electrolytic	CEA 101P 16
C34	Ceramic	CKDYF 403Z 50
C35	Ceramic	CKDYF 403Z 50
C36	Electrolytic	CEA 100P 16
C37	Ceramic	CKDYF 403Z 50
C38	Electrolytic	CEA R47P 50
C39	Mylar	COMA 103K 50
C40	Styrol	QOSA 411K 50
C41	Ceramic	CCDSL 040D 50
C42	Ceramic	CKDYF 403Z 50
C43	Ceramic	CKDYF 403Z 50
C44	Ceramic	CKDYF 403Z 50
C45	Electrolytic	CEA 100P 16
C46	Ceramic	CKDYF 403Z 50
C47	Ceramic	CKDYF 403Z 50
C48	Ceramic	CKDYB 471K 50
C49	Ceramic	CKDYF 103Z 50
C50	Mylar	COMA 472K 50
C51	Mylar	COMA 472K 50
C52	Ceramic	CKDYF 403Z 50
C53	Electrolytic	CSSA R47X 25
C54	Electrolytic	CEA 4R7P 25
C55	Electrolytic	CSSA 3R3M 16

Symbol	Description	Part No.
R6	Carbon film	RD1/PS 331J
R7	Carbon film	RD1/PS 122J
R8	Carbon film	RD1/PS 153J
R9	Carbon film	RD1/PS 823J
R10	Carbon film	RD1/PS 471J
R11	Carbon film	RD1/PS 331J
R13	Carbon film	RD1/PS 104J
R14	Carbon film	RD1/PS 102J
R15	Carbon film	RD1/PS 331J
R16	Carbon film	RD1/PS 472J
R17	Carbon film	RD1/PS 472J
R18	Carbon film	RD1/PS 122J
R19	Carbon film	RD1/PS 103J
R20	Carbon film	RD1/PS 560J
R21	Carbon film	RD1/PS 102J
R22	Carbon film	RD1/PS 102J
R23	Carbon film	RD1/PS 102J
R24	Carbon film	RD1/PS 182J
R25	Carbon film	RD1/PS 822J
R26	Carbon film	RD1/PS 562J
R27	Carbon film	RD1/PS 223J
R28	Carbon film	RD1/PS 104J
R29	Carbon film	RD1/PS 101J
R30	Carbon film	RD1/PS 223J
R31	Carbon film	RD1/PS 333J
R32	Carbon film	RD1/PS 564J
R33	Carbon film	RD1/PS 333J
R34	Carbon film	RD1/PS 394J
R35	Carbon film	RD1/PS 103J
R36	Carbon film	RD1/PS 332J

Symbol	Description	Part No.
C56	Mylar	CQMA 103K 50
C57	Electrolytic	CSSA 3R3M 16
C58	Electrolytic	CEA 010P 50
C59	Styrol	C15-011-A
C60	Ceramic	CKDYB 331K 50
C61	Electrolytic	CEA R47P 50
C62	Mylar	CQMA 154K 50
C63	Mylar	CQMA 183K 50
C64	Mylar	CQMA 183K 50
C65	Electrolytic	CEA 101P 16
C66	Electrolytic	CSSA 2R2M 16
C67	Electrolytic	CSSA 2R2M 16
C68	Ceramic	CKDYF 103Z 50
C69	Mylar	CQMA 122K 50
C70	Mylar	CQMA 122K 50
C71	Ceramic	CKDYB 103K 50
C72	Ceramic	CKDYB 103K 50
C73	Electrolytic	CEA 470P 16
C74	Ceramic	CKDYB 471K 50

## RESISTORS

Symbol	Description	Part No.
VR1	Semi-fixed	C92-047-0
VR2	Semi-fixed	C92-065-A
R1	Carbon film	RD1/PS 331J
R2	Carbon film	RD1/PS 152J
R3	Carbon film	RD1/PS 682J
R4	Carbon film	RD1/PS 472J
R5	Carbon film	RD1/PS 102J

42 FM/AM UNIT  
(continued)

Symbol	Description	Part No.
R37	Carbon film	RD¼PS 101J
R38	Carbon film	RD¼PS 471J
R39	Carbon film	RD¼PS 332J
R40	Carbon film	RD¼PS 222J
R41	Carbon film	RD¼PS 182J
R42	Carbon film	RD¼PS 332J
R43	Carbon film	RD¼PS 273J
R44	Carbon film	RD¼PS 102J
R45	Carbon film	RD¼PS 680J
R46	Carbon film	RD¼PS 123J
R47	Carbon film	RD¼PS 332J
R48	Carbon film	RD¼PS 471J
R49	Carbon film	RD¼PS 102J
R50	Carbon film	RD¼PS 102J
R51	Carbon film	RD¼PS 472J
R52	Carbon film	RD¼PS 104J
R53	Carbon film	RD¼PS 472J
R54	Carbon film	RD¼PS 273J
R55	Carbon film	RD¼PS 331J
R56	Carbon film	RD¼PS 273J
R57	Carbon film	RD¼PS 472J
R58	Carbon film	RD¼PS 183J
R59	Carbon film	RD¼PS 822J
R60	Carbon film	RD¼PS 332J
R61	Carbon film	RD¼PS 472J
R62	Carbon film	RD¼PS 123J
R63	Carbon film	RD¼PS 331J
R64	Carbon film	RD¼PS 103J
R65	Carbon film	RD¼PS 103J
R66	Carbon film	RD¼PS 222J

Symbol	Description	Part No.
R67	Carbon film	RD¼PS 183J
R68	Carbon film	RD¼PS 394J
R69	Carbon film	RD¼PS 105J
R70	Carbon film	RD¼PS 104J
R71	Carbon film	RD¼PS 394J
R72	Carbon film	RD¼PS 104J
R73	Carbon film	RD¼PS 124J
R74	Carbon film	RD¼PS 473J
R75	Carbon film	RD¼PS 222J
R76	Carbon film	RD¼PS 470J
R77	Carbon film	RD¼PS 472J
R78	Carbon film	RD¼PS 104J
R79	Carbon film	RD¼PS 473J
R80	Carbon film	RD¼PS 333J
R81	Carbon film	RD¼PS 471J
R82	Carbon film	RD¼PS 272J
R83	Carbon film	RD¼PS 122J
R84	Carbon film	RD¼PS 122J
R85	Carbon film	RD¼PS 272J
R86	Carbon film	RD¼PS 562J
R87	Carbon film	RD¼PS 562J
R88	Carbon film	RD¼PS 102J
R89	Carbon film	RD¼PS 102J
R90	Carbon film	RD¼PS 333J
R91	Carbon film	RD¼PS 331J
R92	Carbon film	RD¼PS 333J
R93	Carbon film	RD¼PS 330J
R94	Carbon film	RD¼PS 153J
R95	Carbon film	RD¼PS 331J
R96	Carbon film	RD¼PS 682J
R97	Carbon film	RD¼PS 682J



## SEMICONDUCTORS

Symbol	Description	Part No.
Q1	2SC738-D Transistor	
Q2	2SC738-D Transistor	
Q3	TA7060P-GR or W IC	
Q4	2SC738-P Transistor	
Q5	TA7060P-BL IC	
Q6	TA7060P-BL IC	
Q7	2SC711-F or E Transistor	
Q8	2SC711-F or E Transistor	
Q9	2SC711-F or E Transistor	
Q10	2SC711-F or E Transistor	
Q11	2SC711-F or E Transistor	
Q12	2SC382 Transistor	
Q13	2SC738-P Transistor	
Q14	2SC711-F Transistor	
Q15	2SC738-D Transistor	
Q16	29K30-A FET	
Q17	2SC870-F or E Transistor	
Q18	2SC711-F or E Transistor	
Q19	2SC968-Y Transistor	
Q20	2SC711-F or E Transistor	
Q21	M5109P IC	
D2	1S188 FM-1 Diode	
D3	1S2076 Diode	
D4	1S188 FM-1 Diode	
D5	1S188 FM-1 Diode	
D6	1S188 FM-1 Diode	
D7	1S188 FM-1 Diode	
D8	1S2076 Diode	
D9	1S2076 Diode	
D10	1S2076 Diode	
D11	1S188 FM-1 Diode	

## FILTERS

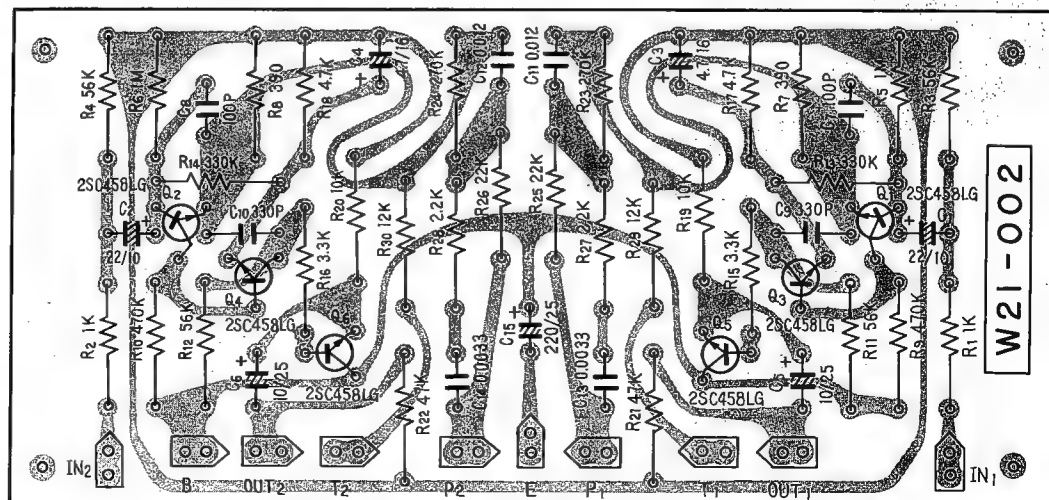
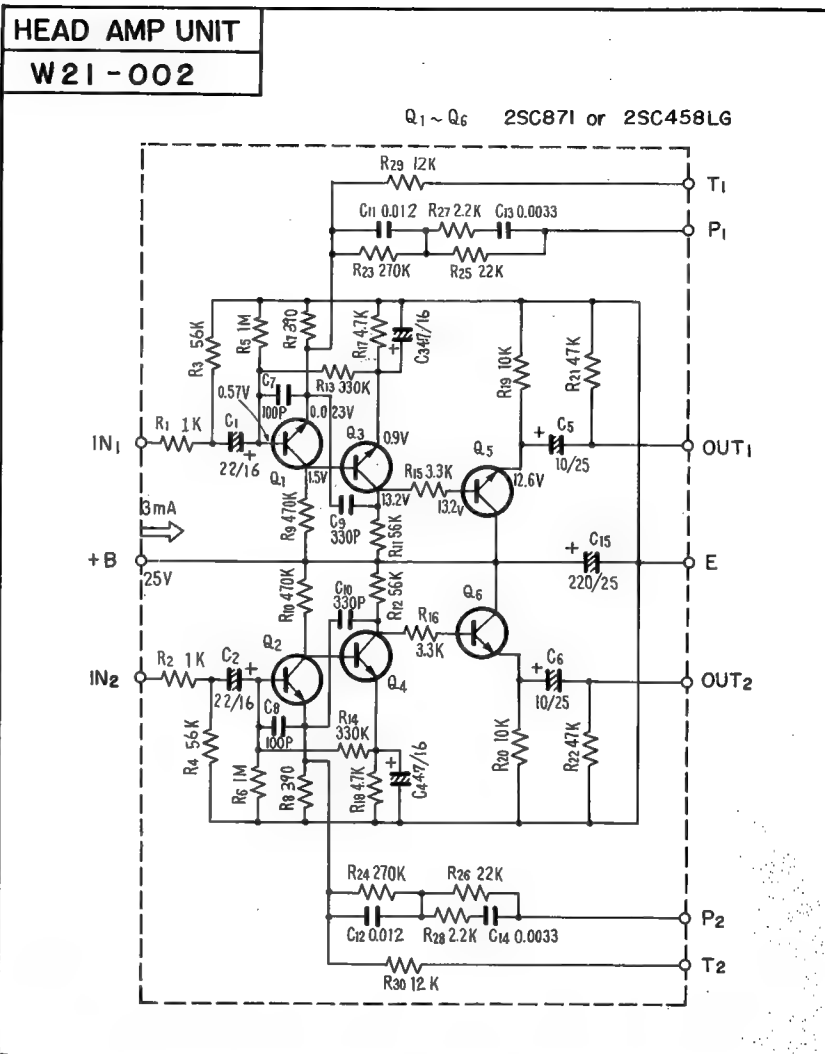
Symbol	Description	Part No.
CF1	FM Ceramic filter	ATF-003-0
CF2	FM Ceramic filter	ATF-001-0
CF3	FM Ceramic filter	ATF-001-0
CF4	AM Ceramic filter	ATF-002-A

## COILS AND TRANSFORMERS

Symbol	Description	Part No.
T1	Matching transformer	ATE-002-0
T2	FM Det. transformer	T74-003-A
T3	AM RF transformer	ATB-003-A
T4	AM OSC transformer	ATB-004-B
T5	AM Det. transformer	ATE-003-B
T6	19kHz coil	T75-023-B
T7	MPX transformer	ATM-005-0
T8	38kHz leak filter	ATM-004-0
T9	38kHz leak filter	ATM-004-0
L1	RF choke coil	T24-028-A
L2	RF choke coil	T24-028-A

QX-9900

# 12.4 HEAD AMP UNIT (W21-002-B)



## PARTS LIST OF HEAD AMP UNIT

### CAPACITORS

Symbol	Description	Part No.
C1	Electrolytic 22 10V	CEA 220P 10
C2	Electrolytic 22 10V	CEA 220P 10
C3	Electrolytic 4.7 16V	CEA 4R7P 16
C4	Electrolytic 4.7 16V	CEA 4R7P 16
C5	Electrolytic 10 25V	CEA 100P 25
C6	Electrolytic 10 25V	CEA 100P 25
C7	Ceramic 100p 50V	CCDSL 101K 50
C8	Ceramic 100p 50V	CCDSL 101K 50
C9	Ceramic 330p 50V	CCDSL 331K 50
C10	Ceramic 330p 50V	CCDSL 331K 50
C11	Mylar 0.012 50V	CQMA 123K 50
C12	Mylar 0.01 50V	CQMA 103K 50
C13	Mylar 0.0033 50V	CQMA 332K 50
C14	Mylar 0.0033 50V	CQMA 332K 50
C15	Electrolytic 220 25V	CEA 221P 25

### RESISTORS

Symbol	Description	Part No.
R1	Carbon film 1k	RD $\frac{1}{4}$ PS 102JNL
R2	Carbon film 1k	RD $\frac{1}{4}$ PS 102JNL
R3	Carbon film 56k	RD $\frac{1}{4}$ PS 563JNL
R4	Carbon film 56k	RD $\frac{1}{4}$ PS 563JNL
R5	Carbon film 1M	RD $\frac{1}{4}$ PS 105JNL
R6	Carbon film 1M	RD $\frac{1}{4}$ PS 105JNL
R7	Carbon film 390	RD $\frac{1}{4}$ PS 391JNL
R8	Carbon film 390	RD $\frac{1}{4}$ PS 391JNL
R9	Carbon film 470k	RD $\frac{1}{4}$ PS 474JNL
R10	Carbon film 470k	RD $\frac{1}{4}$ PS 474JNL

### SEMICONDUCTORS

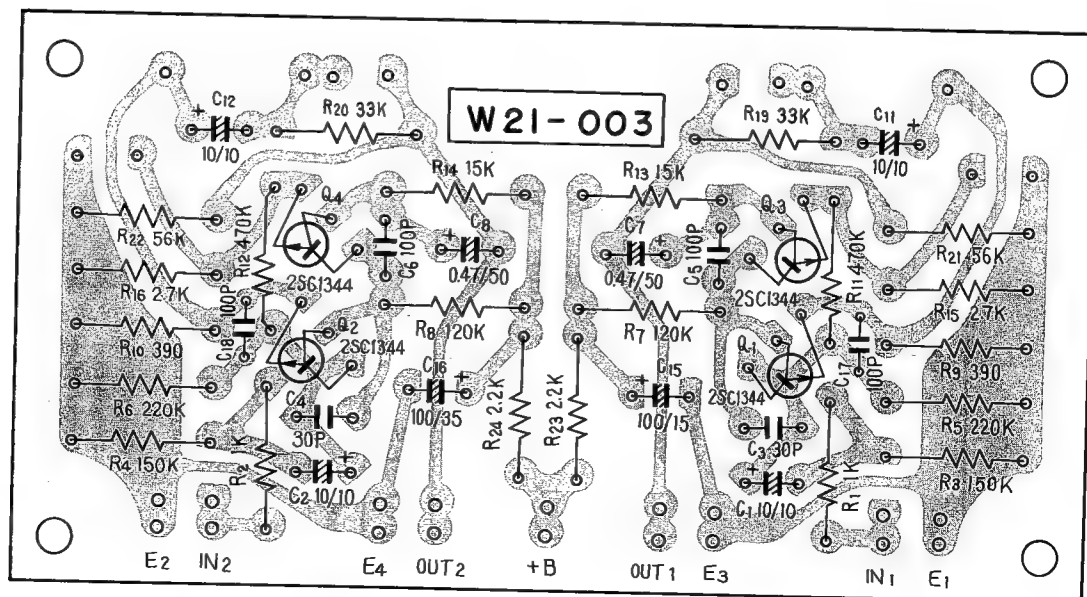
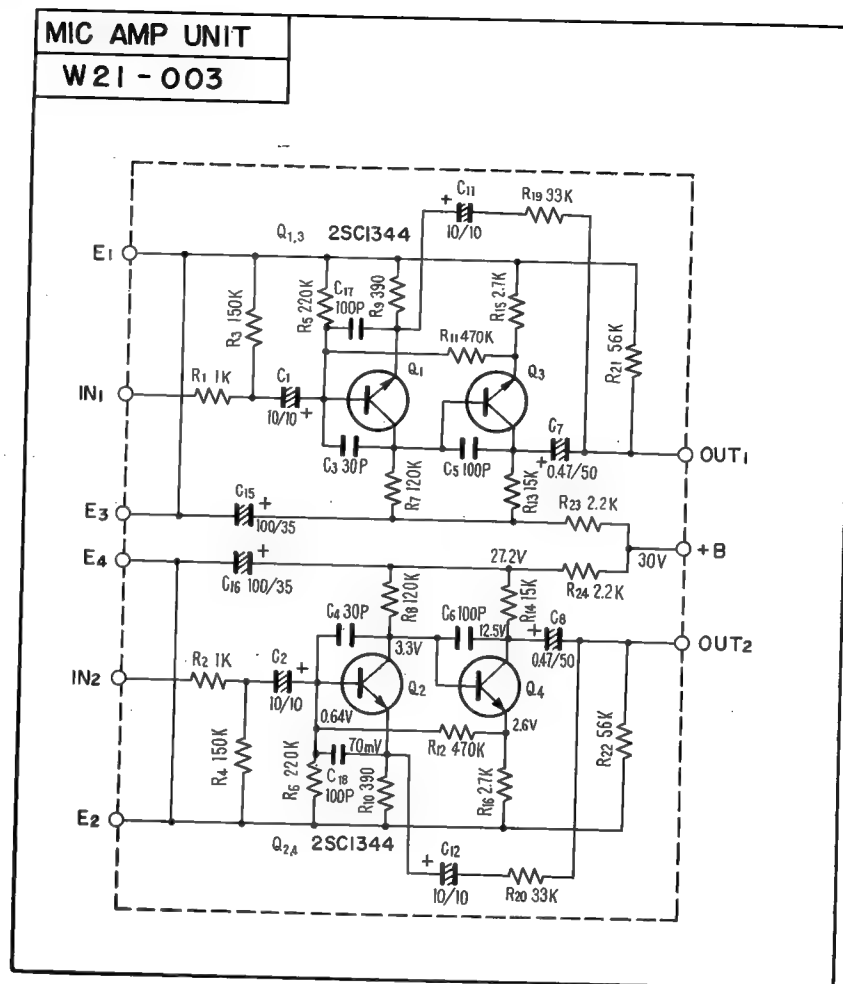
Symbol	Description	Part No.
R11	Carbon film 56k	RD $\frac{1}{4}$ PS 563JNL
R12	Carbon film 56k	RD $\frac{1}{4}$ PS 563JNL
R13	Carbon film 330k	RD $\frac{1}{4}$ PS 334JNL
R14	Carbon film 330k	RD $\frac{1}{4}$ PS 334JNL
R15	Carbon film 3.3k	RD $\frac{1}{4}$ PS 332JNL
R16	Carbon film 3.3k	RD $\frac{1}{4}$ PS 332JNL
R17	Carbon film 4.7k	RD $\frac{1}{4}$ PS 472JNL
R18	Carbon film 4.7k	RD $\frac{1}{4}$ PS 472JNL
R19	Carbon film 10k	RD $\frac{1}{4}$ PS 103JNL
R20	Carbon film 10k	RD $\frac{1}{4}$ PS 103JNL
R21	Carbon film 47k	RD $\frac{1}{4}$ PS 473JNL
R22	Carbon film 47k	RD $\frac{1}{4}$ PS 473JNL
R23	Carbon film 270k	RD $\frac{1}{4}$ PS 274JNL
R24	Carbon film 270k	RD $\frac{1}{4}$ PS 274JNL
R25	Carbon film 22k	RD $\frac{1}{4}$ PS 223JNL
R26	Carbon film 22k	RD $\frac{1}{4}$ PS 223JNL
R27	Carbon film 2.2k	RD $\frac{1}{4}$ PS 222JNL
R28	Carbon film 2.2k	RD $\frac{1}{4}$ PS 222JNL
R29	Carbon film 12k	RD $\frac{1}{4}$ PS 123JNL
R30	Carbon film 12k	RD $\frac{1}{4}$ PS 123JNL

Symbol	Description	Part No.
Q1	2SC458LG-B or C Transistor	
Q2	2SC458LG-B or C Transistor	
Q3	2SC458LG-B or C Transistor	
Q4	2SC458LG-B or C Transistor	
Q5	2SC458LG-B or C Transistor	
Q6	2SC458LG-B or C Transistor	

QX-9900

## 12.5 MIC AMP UNIT (W21-003-A)



# PARTS LIST OF MIC AMP UNIT

## CAPACITORS

Symbol	Description	Part No.
C1	Electrolytic 10	CEA 100P 10
C2	Electrolytic 10	CEA 100P 10
C3	Electrolytic 30p	CCDSL 300K 50
C4	Ceramic 30p	CCDSL 300K 50
C5	Ceramic 100p	CCDSL 101K 50
C6	Ceramic 100p	CCDSL 101K 50
C7	Electrolytic 0.47	CSSA R47M 25
C8	Electrolytic 0.47	CSSA R47M 25
C9		
C10		
C11	Electrolytic 10	CEA 100P 10
C12	Electrolytic 10	CEA 100P 10
C13		
C14	Electrolytic 100	CEA 101P 35
C15		
C16	Electrolytic 100	CEA 101P 35
C17	Ceramic 100p	CCDSL 101K 50
C18	Ceramic 100p	CCDSL 101K 50

## RESISTORS

Symbol	Description	Part No.
R1	Carbon film 1k	RD1/4PS 102J
R2	Carbon film 1k	RD1/4PS 102J
R3	Carbon film 150k	RD1/4PS 154J
R4	Carbon film 150k	RD1/4PS 154J
R5	Carbon film 220k	RD1/4PS 224J

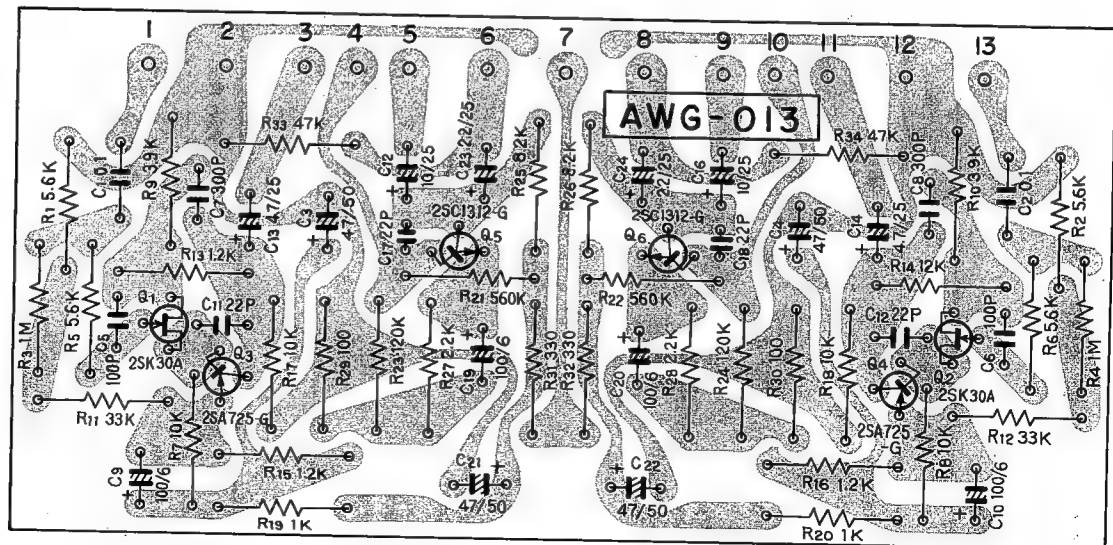
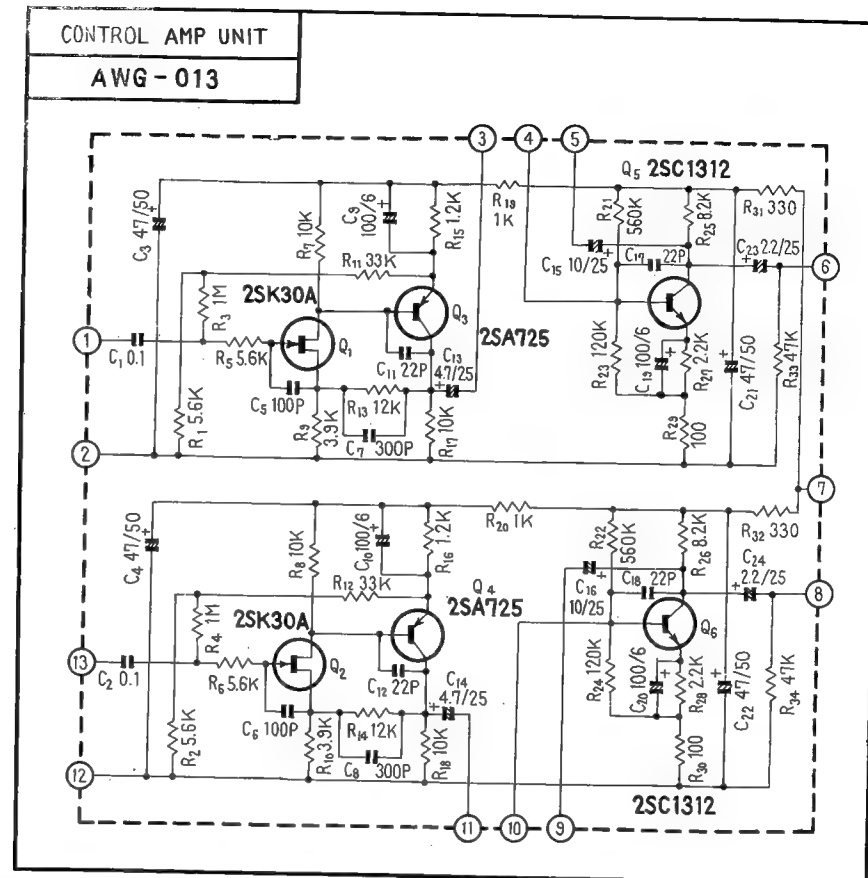
Symbol	Description	Part No.
R6	Carbon film 220k	RD1/4PS 224J
R7	Carbon film 120k	RD1/4PS 124J
R8	Carbon film 120k	RD1/4PS 124J
R9	Carbon film 390	RD1/4PS 391J
R10	Carbon film 390	RD1/4PS 391J
R11	Carbon film 470k	RD1/4PS 474J
R12	Carbon film 470k	RD1/4PS 474J
R13	Carbon film 15k	RD1/4PS 153J
R14	Carbon film 15k	RD1/4PS 153J
R15	Carbon film 2.7k	RD1/4PS 272J
R16	Carbon film 2.7k	RD1/4PS 272J
R17		
R18		
R19	Carbon film 33k	RD1/4PS 333J
R20	Carbon film 33k	RD1/4PS 333J
R21	Carbon film 56k	RD1/4PS 563J
R22	Carbon film 56k	RD1/4PS 563J
R23	Carbon film 2.2k	RD1/4PS 222J
R24	Carbon film 2.2k	RD1/4PS 222J

## SEMICONDUCTORS

Symbol	Description	Part No.
Q1	2SC1344 or 2SC1312 Transistor	
Q2	2SC1344 or 2SC1312 Transistor	
Q3	2SC1344 or 2SC1312 Transistor	
Q4	2SC1344 or 2SC1312 Transistor	

QX-9900

## 12.6 CONTROL AMP UNIT (AWG-013-0)





## PARTS LIST OF CONTROL AMP UNIT

## CAPACITORS

Symbol	Description	Part No.
C1	Mylar 0.1	CQMA 104K 50
C2	Mylar 0.1	CQMA 104K 50
C3	Electrolytic 47	CEA 470P 50
C4	Electrolytic 47	CEA 470P 50
C5	Ceramic 100p	CCDSL 101K 50
C6	Ceramic 100p	CCDSL 101K 50
C7	Ceramic 300p	CKDYB 301K 50
C8	Ceramic 300p	CKDYB 301K 50
C9	Electrolytic 100	CEA 101P 6
C10	Electrolytic 100	CEA 101P 6
C11	Ceramic 22p	CCDSL 220K 50
C12	Ceramic 22p	CCDSL 220K 50
C13	Electrolytic 4.7	CEA 4R7P 25
C14	Electrolytic 4.7	CEA 4R7P 25
C15	Electrolytic 10	CEA 100P 25
C16	Electrolytic 10	CEA 100P 25
C17	Ceramic 22p	CCDSL 220K 50
C18	Ceramic 22p	CCDSL 220K 50
C19	Electrolytic 100	CEA 101P 6
C20	Electrolytic 100	CEA 101P 6
C21	Electrolytic 47	CEA 470P 50
C22	Electrolytic 47	CEA 470P 50
C23	Electrolytic 2.2	CSSA 2R2X 25
C24	Electrolytic 2.2	CSSA 2R2X 25

## RESISTORS

Symbol	Description	Part No.
R1	Carbon film 5.6k	RD¼PS 562J
R2	Carbon film 5.6k	RD¼PS 562J
R3	Carbon film 1M	RD¼PS 105JNL
R4	Carbon film 1M	RD¼PS 105JNL
R5	Carbon film 5.6k	RD¼PS 562J
R6	Carbon film 5.6k	RD¼PS 562J
R7	Carbon film 10k	RD¼PS 103J
R8	Carbon film 10k	RD¼PS 103J
R9	Carbon film 3.9k	RD¼PS 392J
R10	Carbon film 3.9k	RD¼PS 392J
R11	Carbon film 33k	RD¼PS 333J
R12	Carbon film 33k	RD¼PS 333J
R13	Carbon film 12k	RD¼PS 123J
R14	Carbon film 12k	RD¼PS 123J
R15	Carbon film 1.2k	RD¼PS 122J
R16	Carbon film 1.2k	RD¼PS 122J
R17	Carbon film 10k	RD¼PS 103J
R18	Carbon film 10k	RD¼PS 103J
R19	Carbon film 1k	RD¼PS 102J
R20	Carbon film 1k	RD¼PS 102J
R21	Carbon film 560k	RD¼PS 564JNL
R22	Carbon film 560k	RD¼PS 564JNL
R23	Carbon film 120k	RD¼PS 124JNL
R24	Carbon film 120k	RD¼PS 124JNL
R25	Carbon film 8.2k	RD¼PS 822J

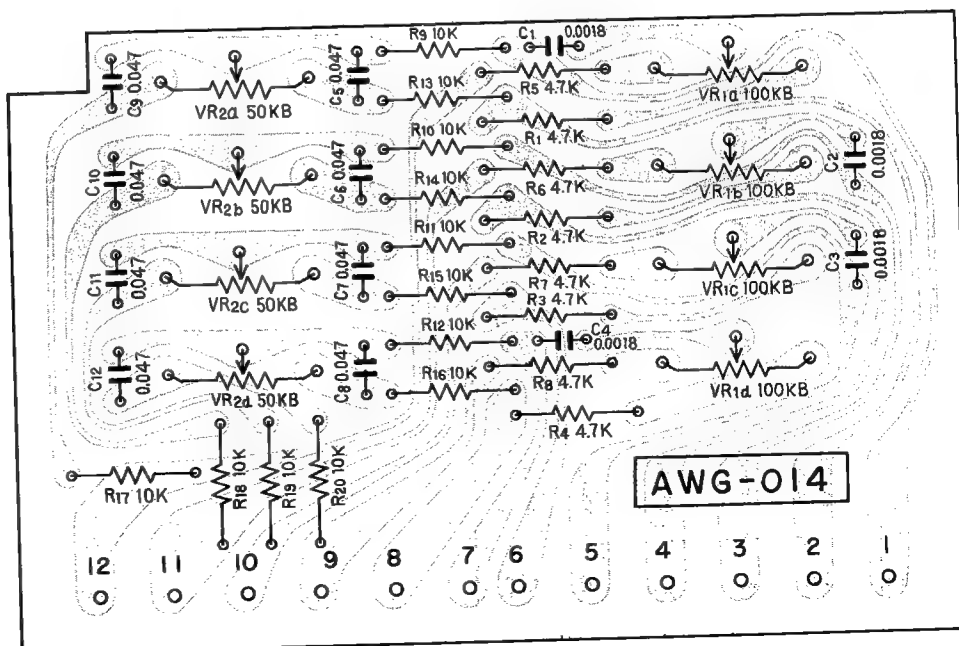
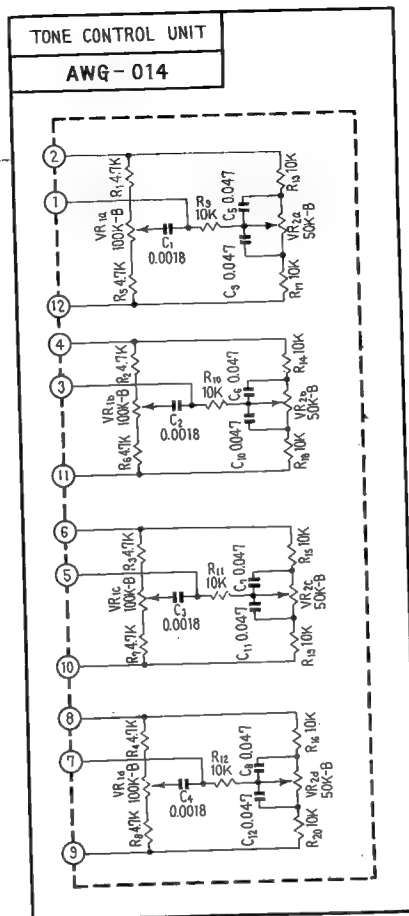
# CONTROL AMP UNIT (continued)

Symbol	Description	Part No.
R26	Carbon film	RD4PS 822J
R27	Carbon film	RD4PS 222J
R28	Carbon film	RD4PS 222J
R29	Carbon film	RD4PS 101J
R30	Carbon film	RD4PS 101J
R31	Carbon film	RD4PS 331J
R32	Carbon film	RD4PS 331J
R33	Carbon film	RD4PS 473J
R34	Carbon film	RD4PS 473J

## SEMICONDUCTORS

Symbol	Description	Part No.
Q1	2SK30A-GR	FET
Q2	2SK30A-GR	FET
Q3	2SA725-G or F	Transistor
Q4	2SA725-G or F	Transistor
Q5	2SC1312-G or F	Transistor
Q6	2SC1312-G or F	Transistor

# 12.7 TONE CONTROL UNIT (AWG-014-0)



## 5 PARTS LIST OF TONE CONTROL UNIT

### CAPACITORS

Symbol	Description	Part No.
C1	Mylar 0.0018 50V	CQMA 182K 50.
C2	Mylar 0.0018 50V	CQMA 182K 50
C3	Mylar 0.0018 50V	CQMA 182K 50
C4	Mylar 0.0018 50V	CQMA 182K 50
C5	Mylar 0.047 50V	CQMA 473J 50
C6	Mylar 0.047 50V	CQMA 473J 50
C7	Mylar 0.047 50V	CQMA 473J 50
C8	Mylar 0.047 50V	CQMA 473J 50
C9	Mylar 0.047 50V	CQMA 473J 50
C10	Mylar 0.047 50V	CQMA 473J 50
C11	Mylar 0.047 50V	CQMA 473J 50
C12	Mylar 0.047 50V	CQMA 473J 50

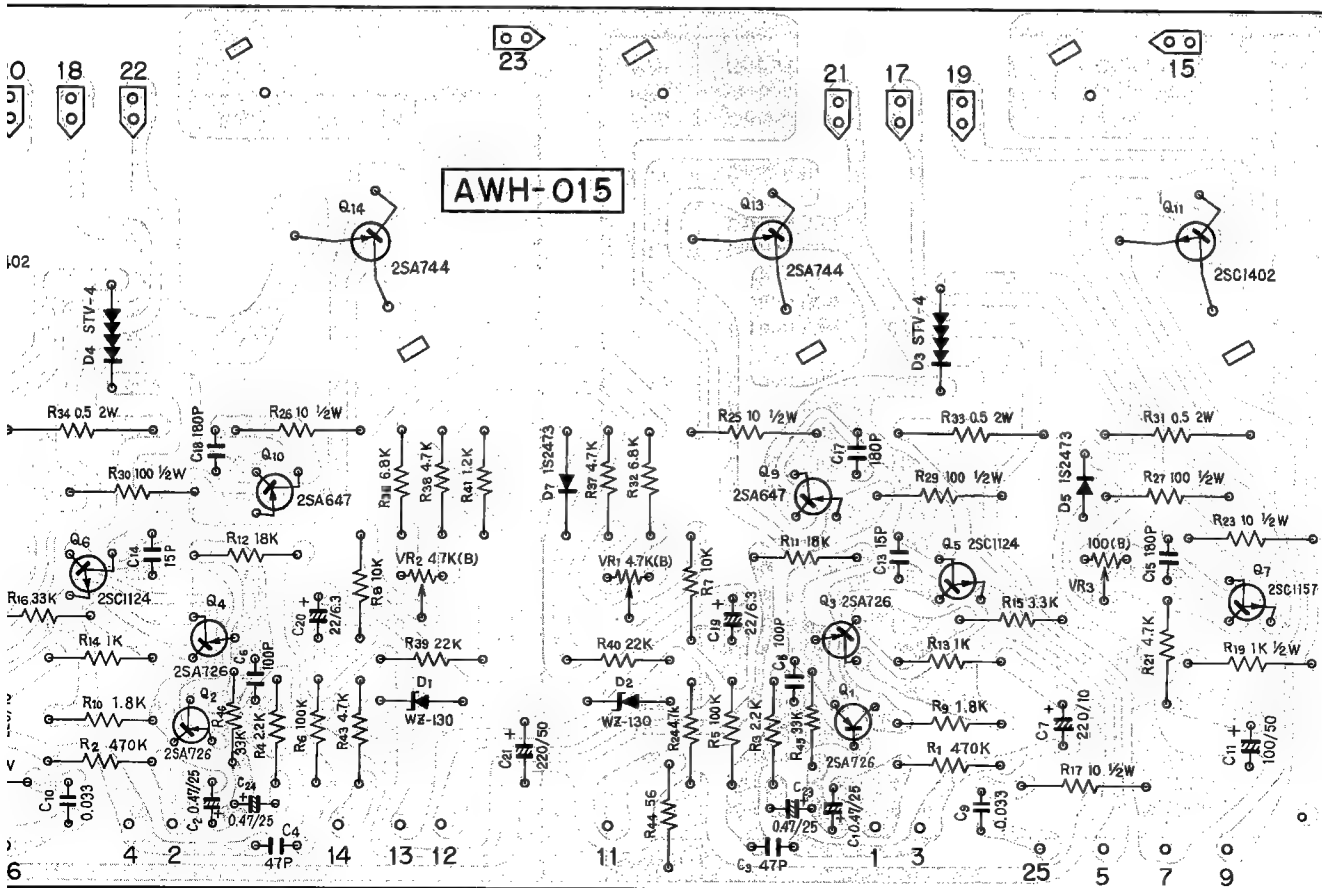
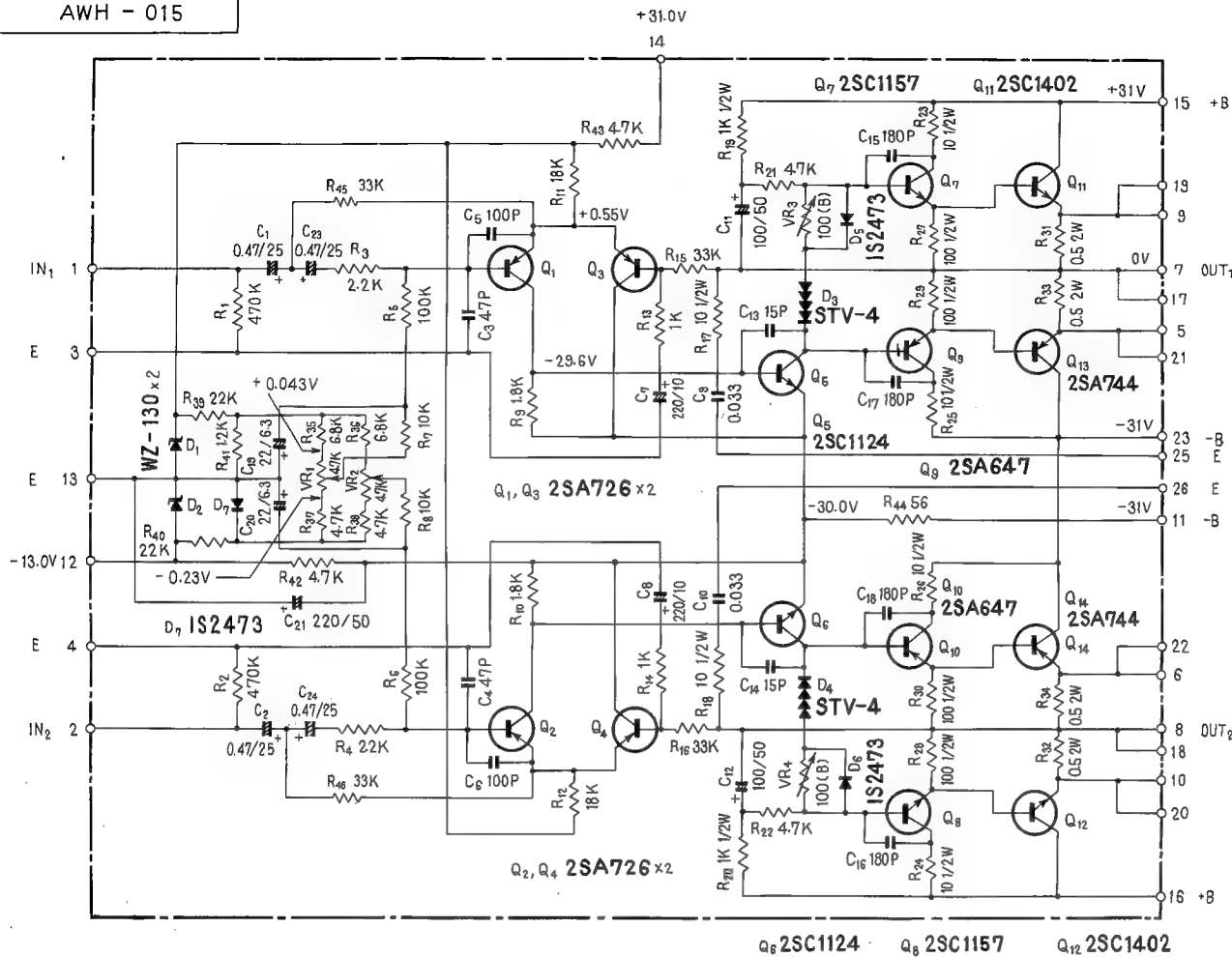
### RESISTORS

Symbol	Description	Part No.
R1	Carbon film 4.7k	RD¼PS 472J
R2	Carbon film 4.7k	RD¼PS 472J
R3	Carbon film 4.7k	RD¼PS 472J
R4	Carbon film 4.7k	RD¼PS 472J
R5	Carbon film 4.7k	RD¼PS 472J
R6	Carbon film 4.7k	RD¼PS 472J
R7	Carbon film 4.7k	RD¼PS 472J
R8	Carbon film 4.7k	RD¼PS 472J
R9	Carbon film 10k	RD¼PS 103J
R10	Carbon film 10k	RD¼PS 103J
R11	Carbon film 10k	RD¼PS 103J
R12	Carbon film 10k	RD¼PS 103J
R13	Carbon film 10k	RD¼PS 103J
R14	Carbon film 10k	RD¼PS 103J
R15	Carbon film 10k	RD¼PS 103J
R16	Carbon film 10k	RD¼PS 103J
R17	Carbon film 10k	RD¼PS 103J
R18	Carbon film 10k	RD¼PS 103J
R19	Carbon film 10k	RD¼PS 103J
R20	Carbon film 10k	RD¼PS 103J
VR1	100k 4-gang, bass	ACV-402-0
VR2	50k-B 4-gang, treble	ACV-403-0

MAIN AMP UNIT

AWH - 015

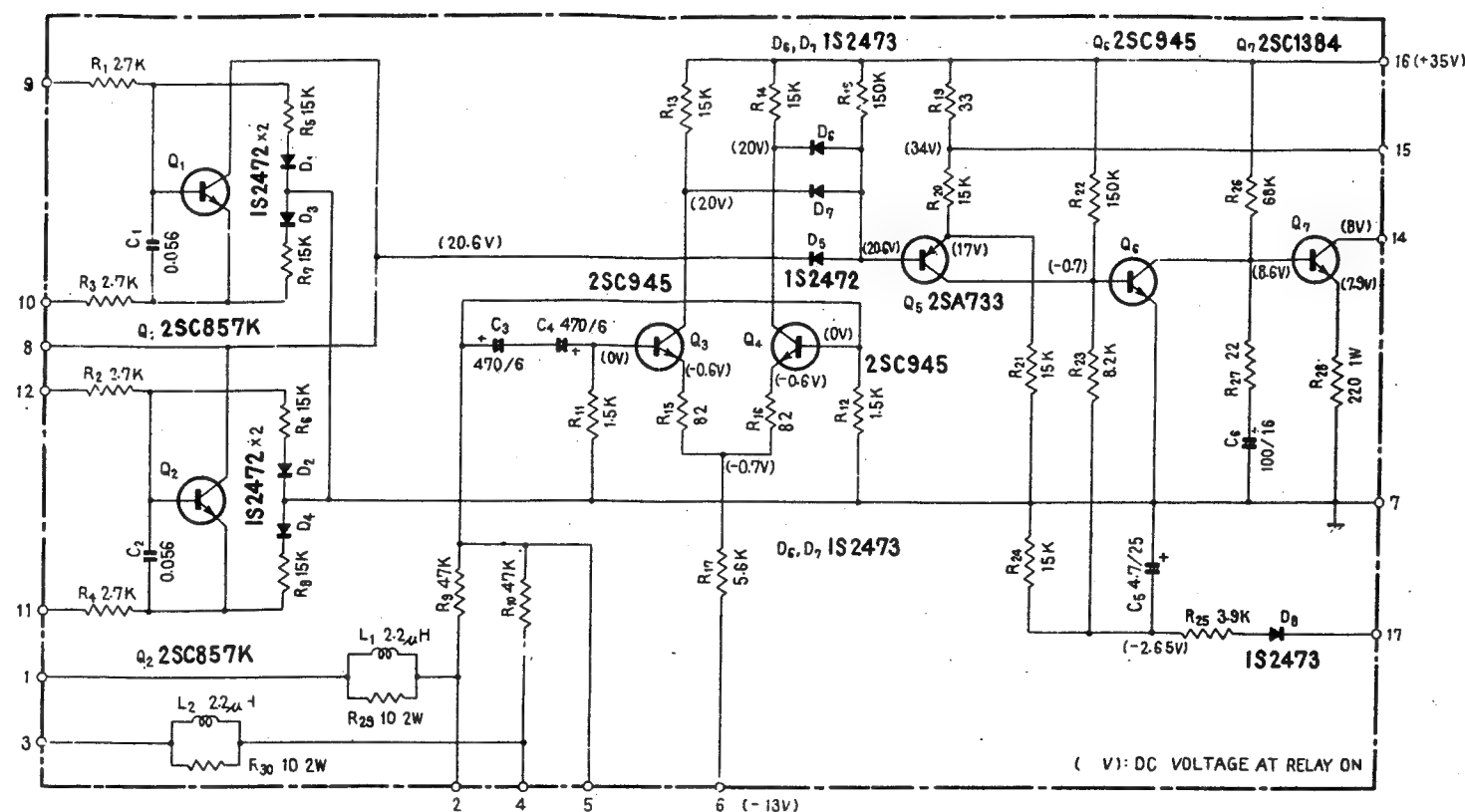
12.8 MAIN AMP UNIT (AWH-015-B)



0066-XD

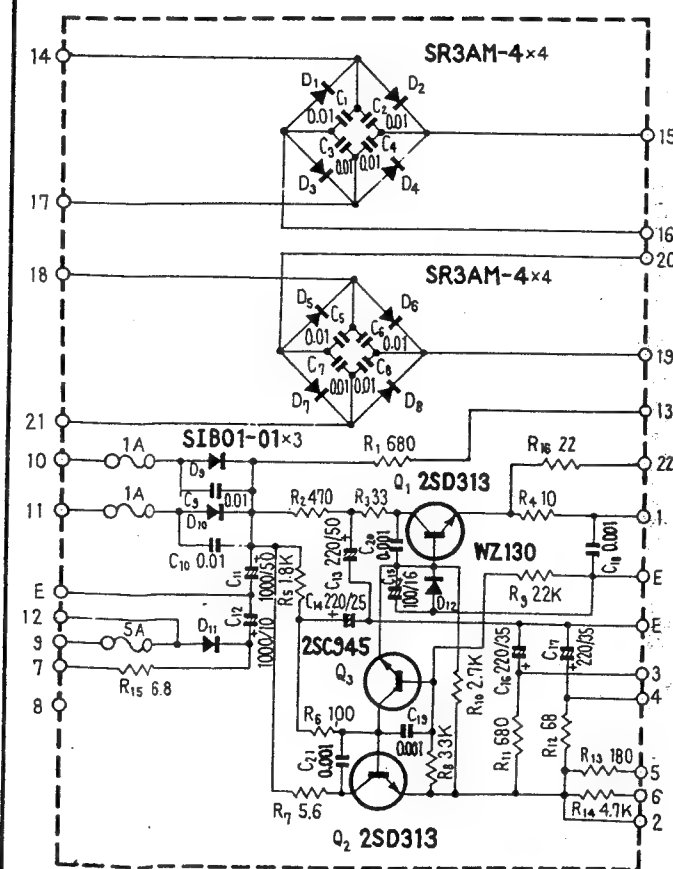
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AWM - 028



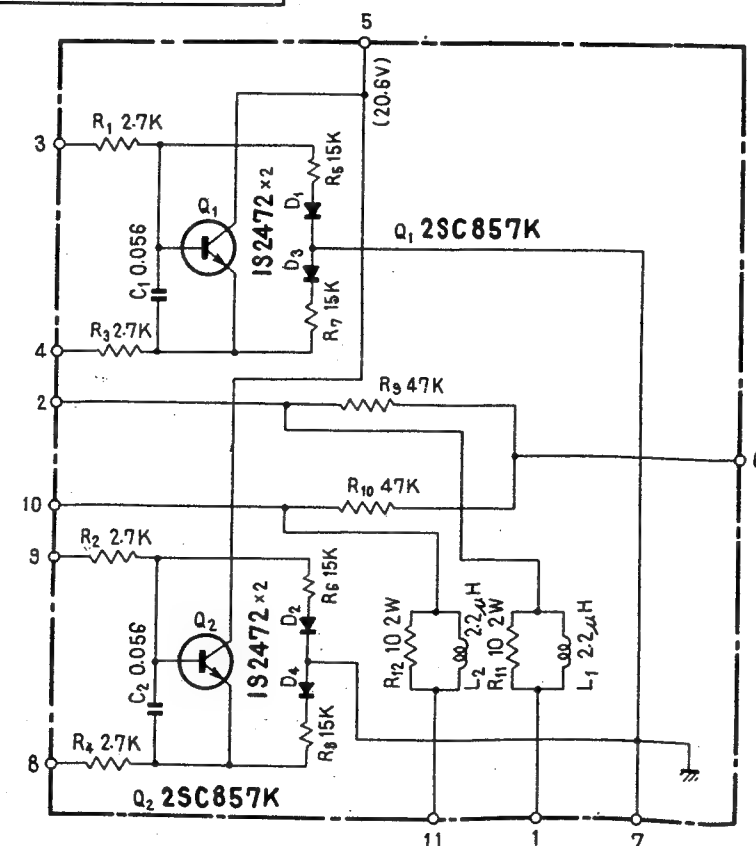
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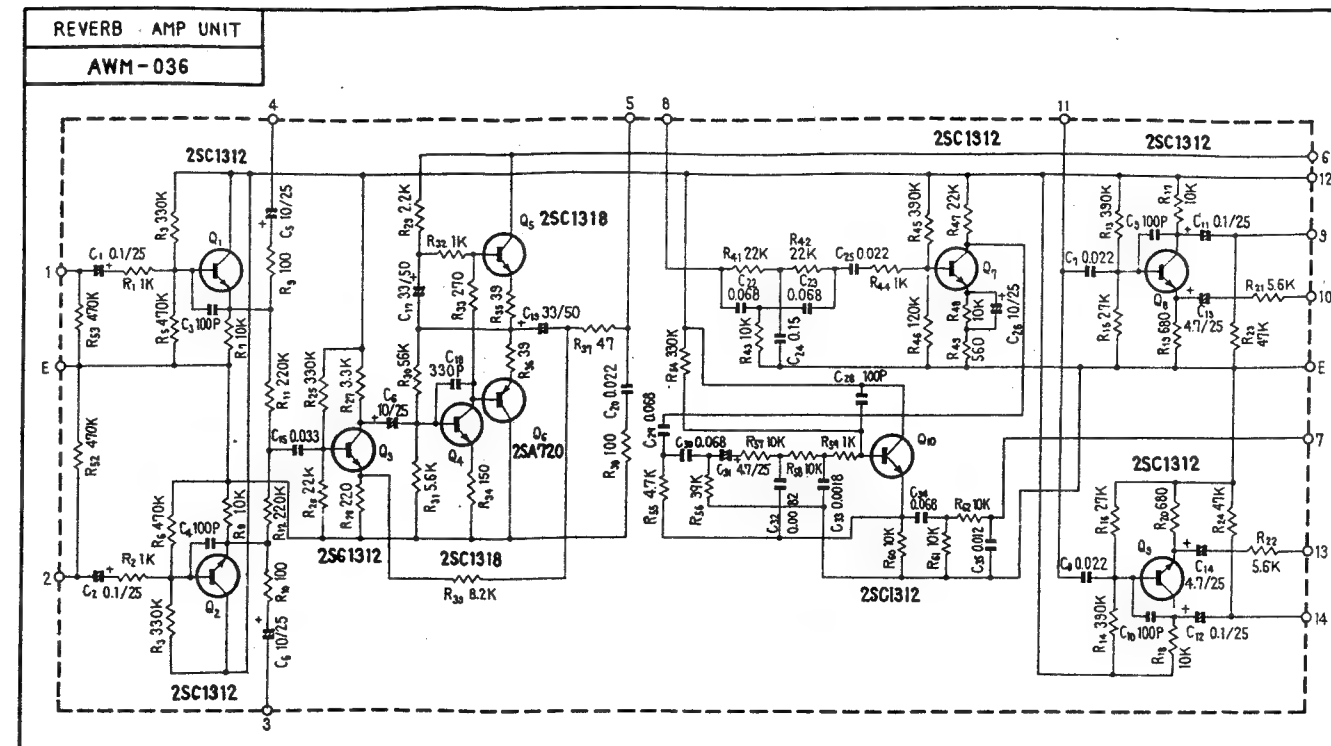
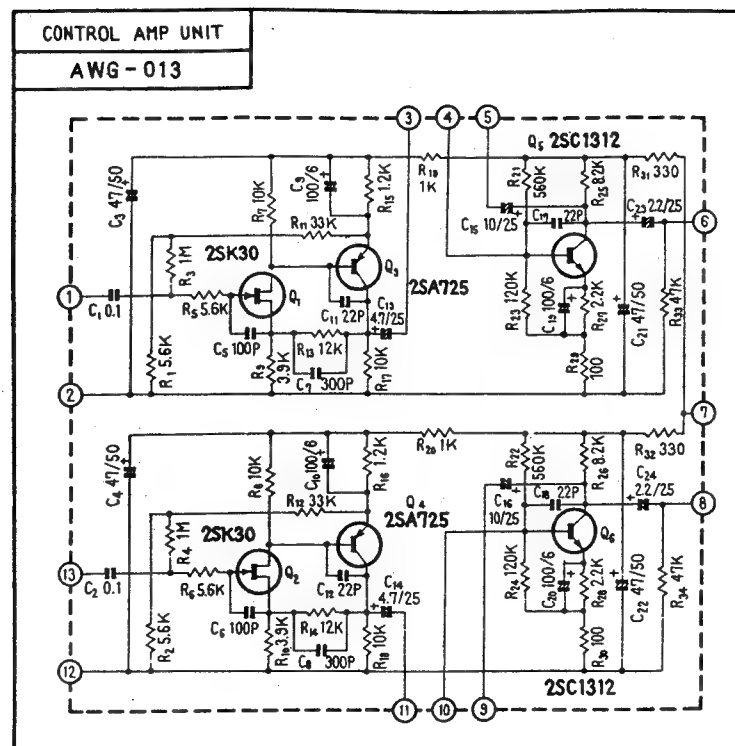
AWR-024



# PROTECTION UNIT

AWM - 029







AIN AMP UNIT

Description		Part No.	
0.47	25V	CSSA	R47X 25
0.47	25V	CSSA	R47X 25
47p	50V	CCDSL	470K 50
47p	50V	CCDSL	470K 50
100p	50V	CCDSL	101K 50
100p	50V	CCDSL	101K 50
220	10V	CEA	221P 10
220	10V	CEA	221P 10
0.033	50V	CQMA	333K 50
0.033	50V	CQMA	333K 50
100	50V	CEA	101P 50
100	50V	CEA	101P 50
15p	50V	CCDSL	150K 50
15p	50V	CCDSL	150K 50
180p	50V	CCDSL	181K 50
180p	50V	CCDSL	181K 50
180p	50V	CCDSL	181K 50
22	6V	CEA	220P 6
22	6V	CEA	220P 6
220	50V	CEA	221P 50
0.47	25V	CSSA	R47X 25
0.47	25V	CSSA	R47X 25

RESISTORS

Symbol	Description		Part No.
R1	Carbon film	470k	RD½PS 474J
R2	Carbon film	470k	RD½PS 474J
R3	Carbon film	2.2k	RD½PS 222J
R4	Carbon film	2.2k	RD½PS 222J
R5	Carbon film	100k	RD½PS 104J
R6	Carbon film	100k	RD½PS 104J
R7	Carbon film	10k	RD½PS 103J
R8	Carbon film	10k	RD½PS 103J
R9	Carbon film	1.8k	RD½PS 182J
R10	Carbon film	1.8k	RD½PS 182J
R11	Carbon film	18k	RD½PS 183J
R12	Carbon film	18k	RD½PS 183J
R13	Carbon film	1k	RD½PS 102J
R14	Carbon film	1k	RD½PS 102J
R15	Carbon film	33k	RD½PS 333J
R16	Carbon film	33k	RD½PS 333J
R17	Carbon film	10 ½W	RD½PS 100J
R18	Carbon film	10 ½W	RD½PS 100J
R19	Carbon film	1k ½W	RD½PS 102J
R20	Carbon film	1k ½W	RD½PS 102J
R21	Carbon film	4.7k	RD½PS 472J
R22	Carbon film	4.7k	RD½PS 472J
R23	Carbon film	10 ½W	RD½PS 100J
R24	Carbon film	10 ½W	RD½PS 100J
R25	Carbon film	10 ½W	RD½PS 100J

Description		Part No.	
10	½W	RD½PS 100J	
100	½W	RD½PS 101J	
100	½W	RD½PS 101J	
100	½W	RD½PS 101J	
100	½W	RD½PS 101J	
0.5	2W	RN2H 0R5K	
0.5	2W	RN2H 0R5K	
0.5	2W	RN2H 0R5K	
0.5	2W	RN2H 0R5K	
6.8k		RD½PS 682J	
6.8k		RD½PS 682J	
4.7k		RD½PS 472J	
4.7k		RD½PS 472J	
22k		RD½PS 223J	
22k		RD½PS 223J	
1.2k		RD½PS 122J	
4.7k		RD½PS 472J	
4.7k		RD½PS 472J	
56		RD½PS 560J	
33k		RD½PS 333J	
33k		RD½PS 333J	
k-B		C92-051-O	
k-B		C92-051-O	
½-B		C92-063-O	
½-B		C92-063-O	

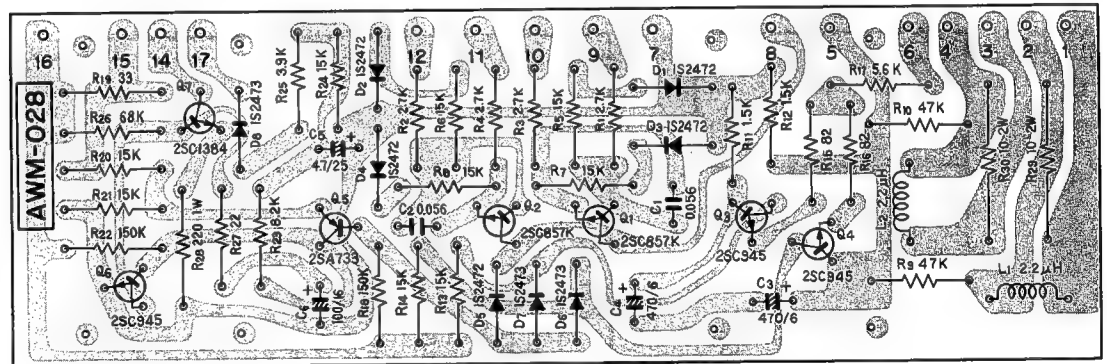
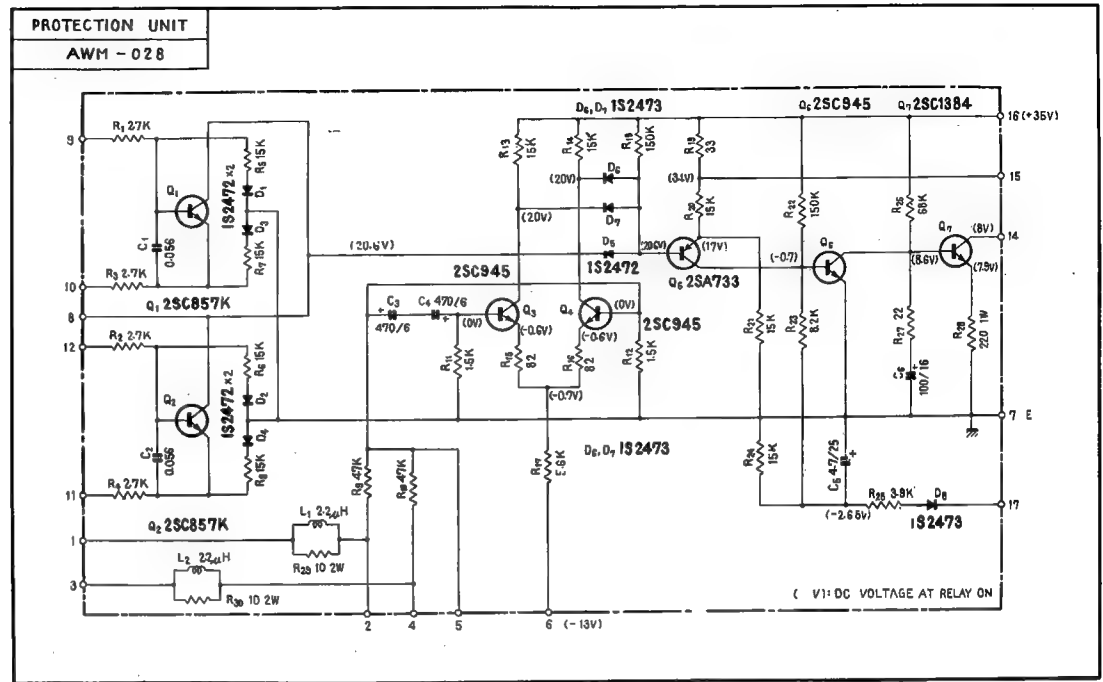
SEMICONDUCTORS

Symbol	Description		Part No.
Q1	2SA726-GW or GY	Transistor	
Q2	2SA726-GW or GY	Transistor	
Q3	2SA726-GW or GY	Transistor	
Q4	2SA726-GW or GY	Transistor	
Q5	2SC1124-2 or 3	Transistor	
Q6	2SC1124-2 or 3	Transistor	
Q7	2SC1157-D or C	Transistor	
Q8	2SC1157-D or C	Transistor	
Q9	2SA647-D or C	Transistor	
Q10	2SA647-D or C	Transistor	
Q11	2SC1402-R or O	Transistor	
Q12	2SC1402-R or O	Transistor	
Q13	2SA744-R or O	Transistor	
Q14	2SA744-R or O	Transistor	
D1	WZ-130	Zener diode	
D2	WZ-130	Zener diode	
D3	STV-4	Varistor	
D4	STV-4	Varistor	
D5	1S2473	Diode	
D6	1S2473	Diode	
D7	1S2473	Diode	

OTHERS

Symbol	Description	Part No.
	Insulating bushing	E32-039-O
	Insulator spacer	E32-040-O

# 12.9 PROTECTION UNIT-1 (AWM-028-0)



## 58 PARTS LIST OF PROTECTION UNIT-1

### CAPACITORS

Symbol	Description	Part No.
C1	Mylar	563K 50
C2	Mylar	563K 50
C3	Electrolytic	CEA 471P 6
C4	Electrolytic	CEA 471P 6
C5	Electrolytic	CEA 471P 25
C6	Electrolytic	CEA 101P 16

### RESISTORS

Symbol	Description	Part No.
R1	Carbon film	RD1/4PS 272J
R2	Carbon film	RD1/4PS 272J
R3	Carbon film	RD1/4PS 272J
R4	Carbon film	RD1/4PS 272J
R5	Carbon film	RD1/4PS 153J
R6	Carbon film	RD1/4PS 153J
R7	Carbon film	RD1/4PS 153J
R8	Carbon film	RD1/4PS 153J
R9	Carbon film	RD1/4PS 473J
R10	Carbon film	RD1/4PS 473J
R11	Carbon film	RD1/4PS 152J
R12	Carbon film	RD1/4PS 152J
R13	Carbon film	RD1/4PS 153J
R14	Carbon film	RD1/4PS 153J
R15	Carbon film	RD1/4PS 820J

Symbol	Description	Part No.
R16	Carbon film	RD1/4PS 820J
R17	Carbon film	RD1/4PS 562J
R18	Carbon film	RD1/4PS 154J
R19	Carbon film	RD1/4PS 330J
R20	Carbon film	RD1/4PS 153J
R21	Carbon film	RD1/4PS 153J
R22	Carbon film	RD1/4PS 154J
R23	Carbon film	RD1/4PS 822J
R24	Carbon film	RD1/4PS 153J
R25	Carbon film	RD1/4PS 392J
R26	Carbon film	RD1/4PS 683J
R27	Carbon film	RD1/4PS 220J
R28	Metal oxide	RS1P 221J
R29	Metal oxide	RS2P 100J
R30	Metal oxide	RS2P 100J

### SEMICONDUCTORS

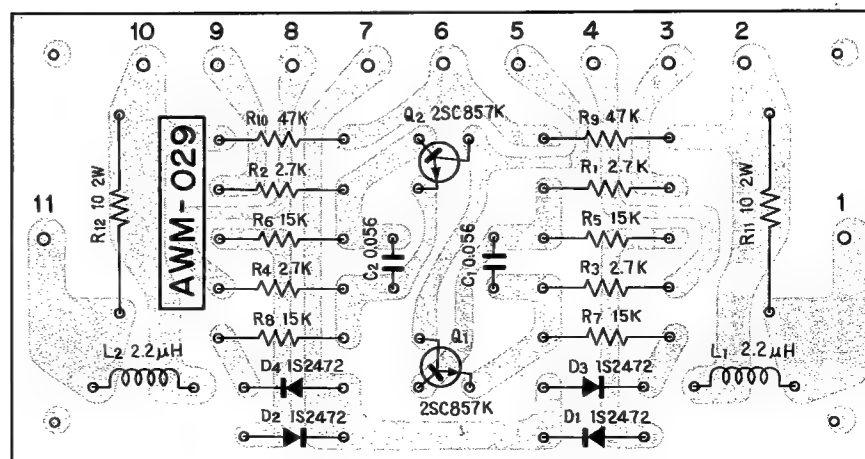
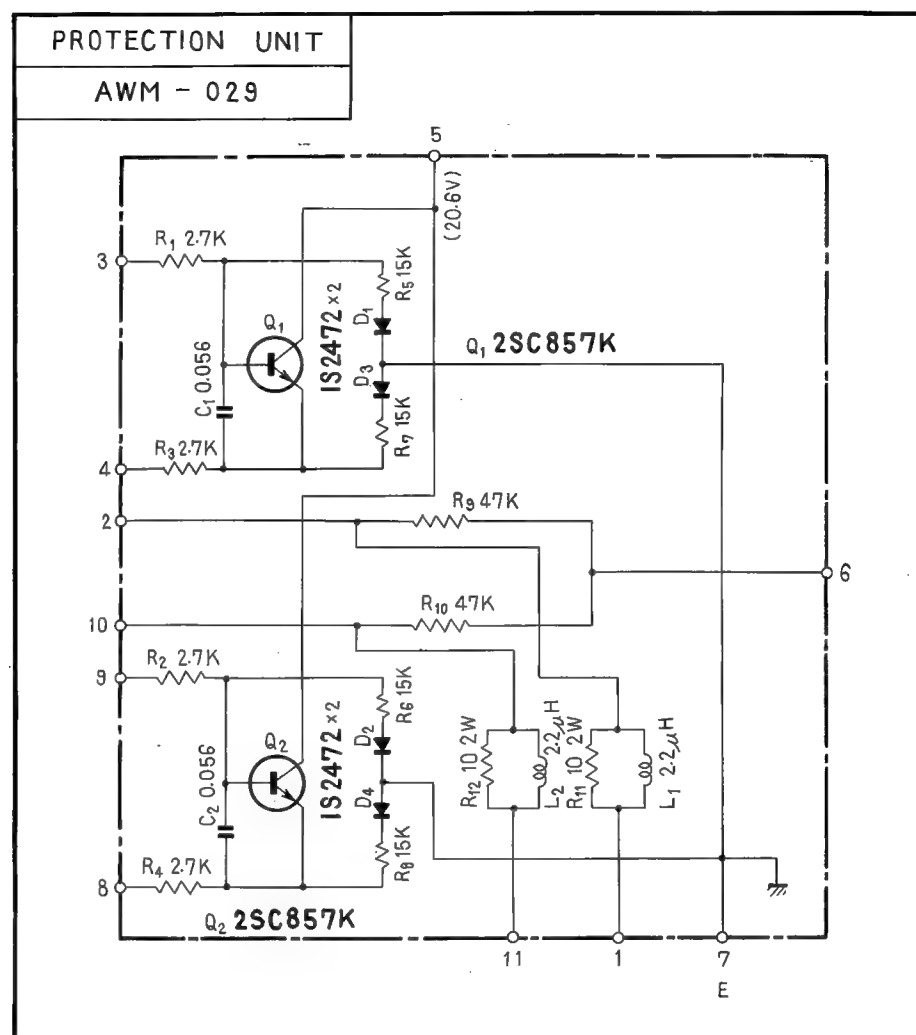
Symbol	Description	Part No.
Q1	2SC857K-A Transistor	
Q2	2SC857K-A Transistor	
Q3	2SC945-Q or R Transistor	
Q4	2SC945-Q or R Transistor	
Q5	2SA733-Q or R Transistor	
Q6	2SC945-Q or R Transistor	
Q7	2SC1384-R or Q Transistor	

Symbol	Description	Part No.
D1	1S2472 Diode	
D2	1S2472 Diode	
D3	1S2472 Diode	
D4	1S2472 Diode	
D5	1S2472 Diode	
D6	1S2473 Diode	
D7	1S2473 Diode	
D8	1S2473 Diode	

# COILS

Symbol	Description	Part No.
L1	AF choke coil	T63-009-A
L2	AF choke coil	T63-009-A

## 12.10 PROTECTION UNIT-2 (AWM-029-0)



## PARTS LIST OF PROTECTION UNIT-2

### CAPACITORS

Symbol	Description	Part No.
C1	Mylar 0.056 50V	CQMA 563K 50
C2	Mylar 0.056 50V	CQMA 563K 50

### RESISTORS

Symbol	Description	Part No.
R1	Carbon film 2.7k	RD%PS 272J
R2	Carbon film 2.7k	RD%PS 272J
R3	Carbon film 2.7k	RD%PS 272J
R4	Carbon film 2.7k	RD%PS 272J
R5	Carbon film 15k	RD%PS 153J
R6	Carbon film 15k	RD%PS 153J
R7	Carbon film 15k	RD%PS 153J
R8	Carbon film 15k	RD%PS 153J
R9	Carbon film 47k	RD%PS 473J
R10	Carbon film 47k	RD%PS 473J
R11	Metal oxide 10 2W	RS2P 100J
R12	Metal oxide 10 2W	RS2P 100J

### SEMICONDUCTORS

Symbol	Description	Part No.
Q1	2SC857K-A Transistor	
Q2	2SC857K-A Transistor	
D1	1S2472 Diode	
D2	1S2472 Diode	
D3	1S2472 Diode	
D4	1S2472 Diode	

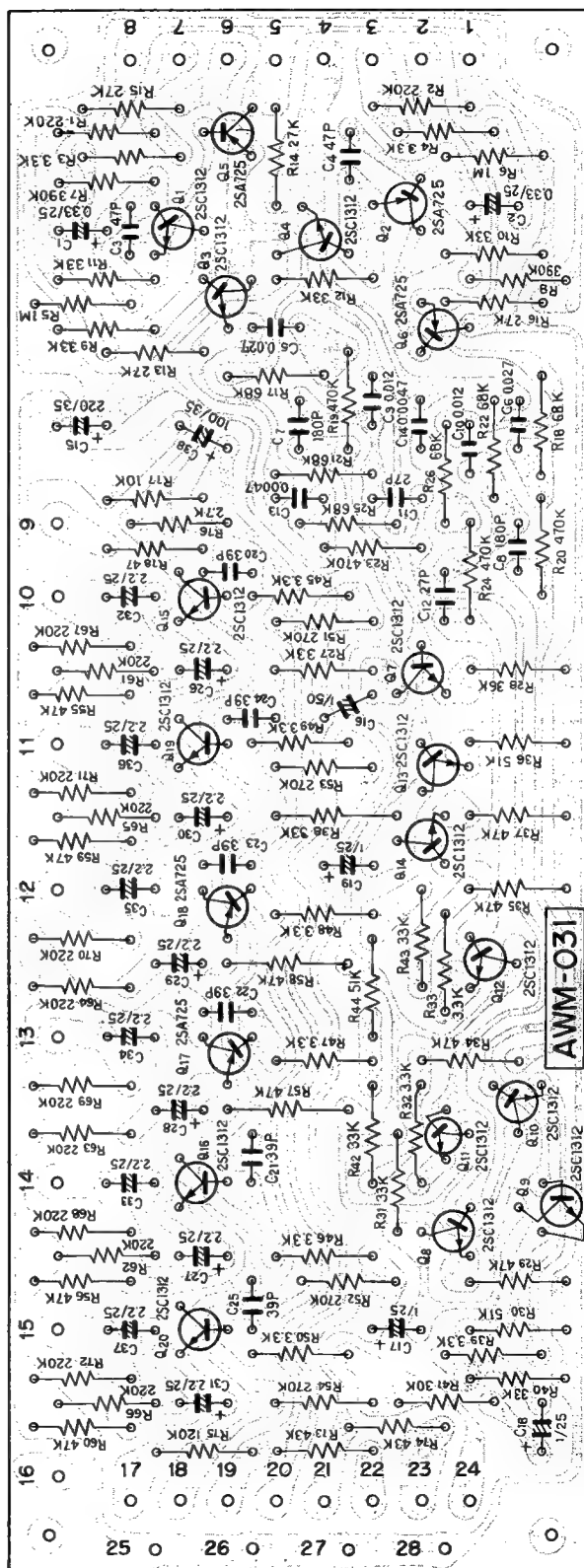
### COILS

Symbol	Description	Part No.
L1	AF choke coil	T63-009-A
L2	AF choke coil	T63-009-A

QX-9900







## 64 PARTS LIST OF DECODER UNIT

### CAPACITORS

Symbol	Description	Part No.
C1	Electrolytic	CSSA R33M 25
C2	Electrolytic	CSSA R33M 25
C3	Ceramic	CCDSL 470K 50
C4	Ceramic	CCDSL 470K 50
C5	MyIar	CCMA 273J 50
C6	MyIar	CCMA 273J 50
C7	Ceramic	CCDSL 181J 50
C8	Ceramic	CCDSL 181J 50
C9	MyIar	CCMA 123J 50
C10	MyIar	CCMA 123J 50
C11	Ceramic	CCDSL 270J 50
C12	Ceramic	CCDSL 270J 50
C13	MyIar	CCMA 472J 50
C14	MyIar	CCMA 472J 50
C15	Electrolytic	CEA 221P 35
C16	Electrolytic	CEA 010M 25NP
C17	Electrolytic	CSSA 010M 25
C18	Electrolytic	CSSA 010M 25
C19	Electrolytic	CSSA 010M 25
C20	Ceramic	CCDSL 390K 50
C21	Ceramic	CCDSL 390K 50
C22	Ceramic	CCDSL 390K 50
C23	Ceramic	CCDSL 390K 50
C24	Ceramic	CCDSL 390K 50
C25	Ceramic	CCDSL 390K 50

Symbol	Description	Part No.
C26	Electrolytic	CSSA 2R2M 25
C27	Electrolytic	CSSA 2R2M 25
C28	Electrolytic	CSSA 2R2M 25
C29	Electrolytic	CSSA 2R2M 25
C30	Electrolytic	CSSA 2R2M 25
C31	Electrolytic	CSSA 2R2M 25
C32	Electrolytic	CEA 2R2M 25NP
C33	Electrolytic	CEA 2R2M 25NP
C34	Electrolytic	CEA 2R2M 25NP
C35	Electrolytic	CEA 2R2M 25NP
C36	Electrolytic	CEA 2R2M 25NP
C37	Electrolytic	CEA 2R2M 25NP
C38	Electrolytic	CEA 101P 35

### RESISTORS

Symbol	Description	Part No.
R1	Carbon film	RD¼PM 224J
R2	Carbon film	RD¼PM 224J
R3	Carbon film	RD¼PM 332J
R4	Carbon film	RD¼PM 332J
R5	Carbon film	RD¼PM 105J
R6	Carbon film	RD¼PM 105J
R7	Carbon film	RD¼PM 394J
R8	Carbon film	RD¼PM 394J
R9	Carbon film	RD¼PM 333J
R10	Carbon film	RD¼PM 333J
R11	Carbon film	RD¼PM 333J
R12	Carbon film	RD¼PM 333J
R13	Carbon film	RD¼PM 273J
R14	Carbon film	RD¼PM 273J
R15	Carbon film	RD¼PM 273J

Symbol	Description	Part No.
R46	Carbon film	RD¼PM 332J
R47	Carbon film	RD¼PM 332J
R48	Carbon film	RD¼PM 332J
R49	Carbon film	RD¼PM 332J
R50	Carbon film	RD¼PM 332J
R51	Carbon film	RD¼PM 274J
R52	Carbon film	RD¼PM 274J
R53	Carbon film	RD¼PM 274J
R54	Carbon film	RD¼PM 274J
R55	Carbon film	RD¼PM 473J
R56	Carbon film	RD¼PM 473J
R57	Carbon film	RD¼PM 473J
R58	Carbon film	RD¼PM 473J
R59	Carbon film	RD¼PM 473J
R60	Carbon film	RD¼PM 473J
R61	Carbon film	RD¼PM 224J
R62	Carbon film	RD¼PM 224J
R63	Carbon film	RD¼PM 224J
R64	Carbon film	RD¼PM 224J
R65	Carbon film	RD¼PM 224J
R66	Carbon film	RD¼PM 224J
R67	Carbon film	RD¼PM 224J
R68	Carbon film	RD¼PM 224J
R69	Carbon film	RD¼PM 224J
R70	Carbon film	RD¼PM 224J
R71	Carbon film	RD¼PM 224J
R72	Carbon film	RD¼PM 224J
R73	Carbon film	RD¼PM 433J
R74	Carbon film	RD¼PM 433J
R75	Carbon film	RD¼PM 124J
R76	Carbon film	RD¼PM 272J
R77	Carbon film	RD¼PM 103J
R78	Carbon film	RD¼PM 470J

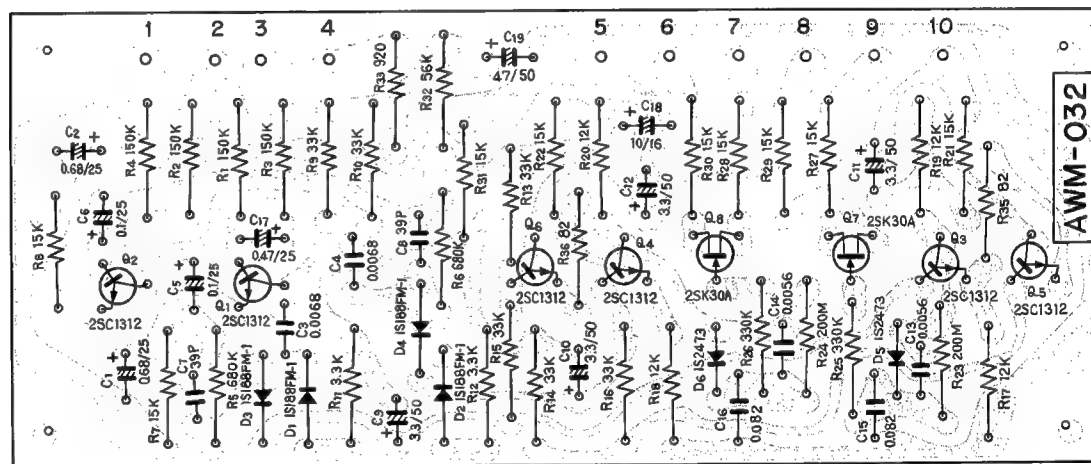
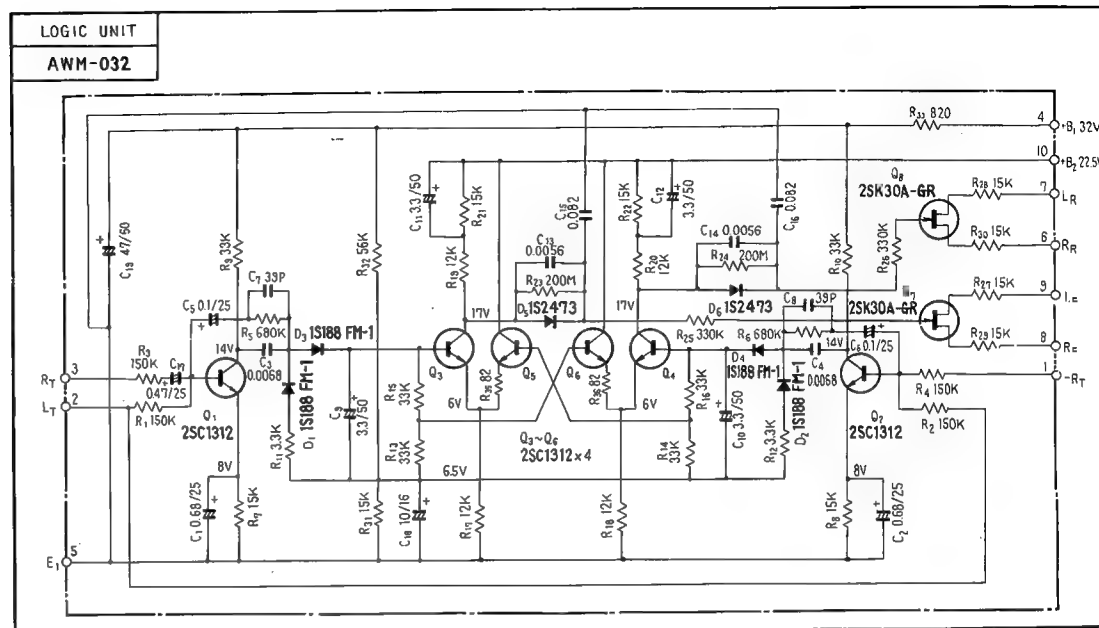
Symbol	Description	Part No.
R16	Carbon film	RD¼PM 273J
R17	Carbon film	RD¼PM 683J
R18	Carbon film	RD¼PM 683J
R19	Carbon film	RD¼PM 474J
R20	Carbon film	RD¼PM 474J
R21	Carbon film	RD¼PM 683J
R22	Carbon film	RD¼PM 683J
R23	Carbon film	RD¼PM 474J
R24	Carbon film	RD¼PM 474J
R25	Carbon film	RD¼PM 683J
R26	Carbon film	RD¼PM 683J
R27	Carbon film	RD¼PM 333J
R28	Carbon film	RD¼PM 363J
R29	Carbon film	RD¼PM 473J
R30	Carbon film	RD¼PM 513J
R31	Carbon film	RD¼PM 333J
R32	Carbon film	RD¼PM 332J
R33	Carbon film	RD¼PM 332J
R34	Carbon film	RD¼PM 473J
R35	Carbon film	RD¼PM 473J
R36	Carbon film	RD¼PM 513J
R37	Carbon film	RD¼PM 473J
R38	Carbon film	RD¼PM 333J
R39	Carbon film	RD¼PM 332J
R40	Carbon film	RD¼PM 333J
R41	Carbon film	RD¼PM 303J
R42	Carbon film	RD¼PM 333J
R43	Carbon film	RD¼PM 333J
R44	Carbon film	RD¼PM 513J
R45	Carbon film	RD¼PM 332J

66 DECODER UNIT  
(continued)

SEMICONDUCTORS

Symbol	Description	Part No.
Q1	2SC1312-F or G Transistor	
Q2	2SA725-F or G Transistor	
Q3	2SC1312-F or G Transistor	
Q4	2SC1312-F or G Transistor	
Q5	2SA725-F or G Transistor	
Q6	2SA725-F or G Transistor	
Q7	2SC1312-G Transistor	
Q8	2SC1312-G Transistor	
Q9	2SC1312-G Transistor	
Q10	2SC1312-G Transistor	
Q11	2SC1312-G Transistor	
Q12	2SC1312-G Transistor	
Q13	2SC1312-G Transistor	
Q14	2SC1312-G Transistor	
Q15	2SC1312-F or G Transistor	
Q16	2SC1312-F or G Transistor	
Q17	2SA725-F or G Transistor	
Q18	2SA725-F or G Transistor	
Q19	2SC1312-F or G Transistor	
Q20	2SC1312-F or G Transistor	

# 12.12 LOGIC UNIT (AWM-032-A)



## 8 PARTS LIST OF LOGIC UNIT

### CAPACITORS

Symbol	Description	Part No.
C1	Electrolytic	CSSA R68M 25
C2	Electrolytic	CSSA R68M 25
C3	Mylar	CQMA 682K 50
C4	Mylar	CQMA 682K 50
C5	Electrolytic	CSSA 0R1M 25
C6	Electrolytic	CSSA 0R1M 25
C7	Ceramic	CCDSL 390K 50
C8	Ceramic	CCDSL 390K 50
C9	Electrolytic	CEA 3R3P 50
C10	Electrolytic	CEA 3R3P 50
C11	Electrolytic	CEA 3R3P 50
C12	Electrolytic	CEA 3R3P 50
C13	Mylar	CQMA 562K 50
C14	Mylar	CQMA 562K 50
C15	Mylar	CQMA 823K 50
C16	Mylar	CQMA 823K 50
C17	Electrolytic	CSSA R47M 25
C18	Electrolytic	CEA 100P 16
C19	Electrolytic	CEA 470P 50

### RESISTORS

Symbol	Description	Part No.
R1	Carbon film	RD¼PS 154J
R2	Carbon film	RD¼PS 154J
R3	Carbon film	RD¼PS 154J
R4	Carbon film	RD¼PS 154J
R5	Carbon film	RD¼PS 684J
R6	Carbon film	RD¼PS 684J
R7	Carbon film	RD¼PS 153J
R8	Carbon film	RD¼PS 153J
R9	Carbon film	RD¼PS 333J
R10	Carbon film	RD¼PS 333J
R11	Carbon film	RD¼PS 332J
R12	Carbon film	RD¼PS 332J
R13	Carbon film	RD¼PS 333J
R14	Carbon film	RD¼PS 333J
R15	Carbon film	RD¼PS 333J
R16	Carbon film	RD¼PS 333J
R17	Carbon film	RD¼PS 123J
R18	Carbon film	RD¼PS 123J
R19	Carbon film	RD¼PS 123J
R20	Carbon film	RD¼PS 123J
R21	Carbon film	RD¼PS 153J
R22	Carbon film	RD¼PS 153J
R23	Composition	ACN-001-0
R24	Composition	ACN-001-0
R25	Carbon film	RD¼PS 334J
R26	Carbon film	RD¼PS 334J
R27	Carbon film	RD¼PS 153J
R28	Carbon film	RD¼PS 153J
R29	Carbon film	RD¼PS 153J
R30	Carbon film	RD¼PS 153J

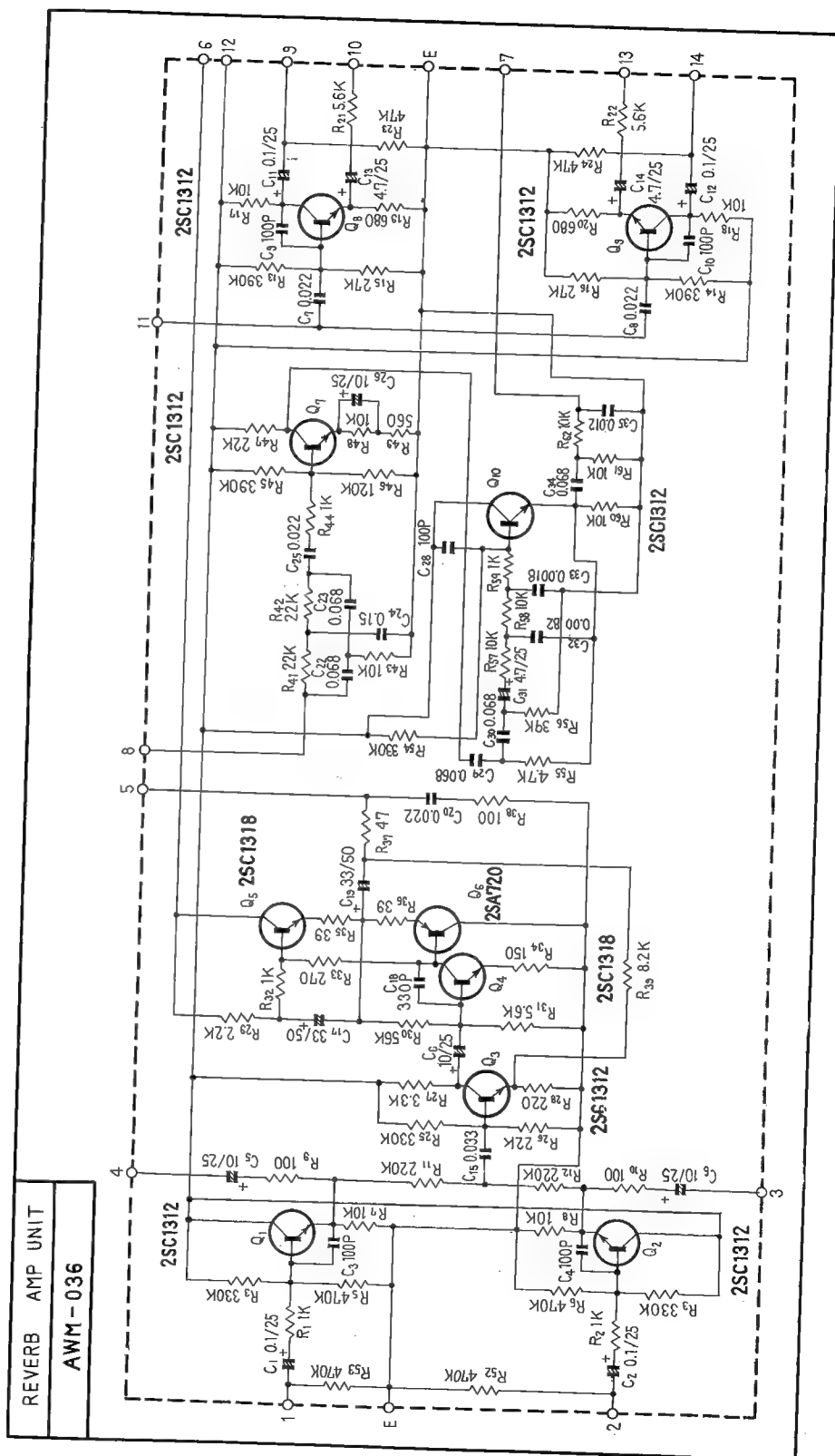
Symbol	Description	Part No.
R31	Carbon film 56k	RD1/4PS 563J
R32	Carbon film 56k	RD1/4PS 563J
R33	Carbon film 820	RD1/4PS 821J
R34	Carbon film 82	RD1/4PS 820J
R35	Carbon film 82	RD1/4PS 820J
R36	Carbon film 82	RD1/4PS 820J

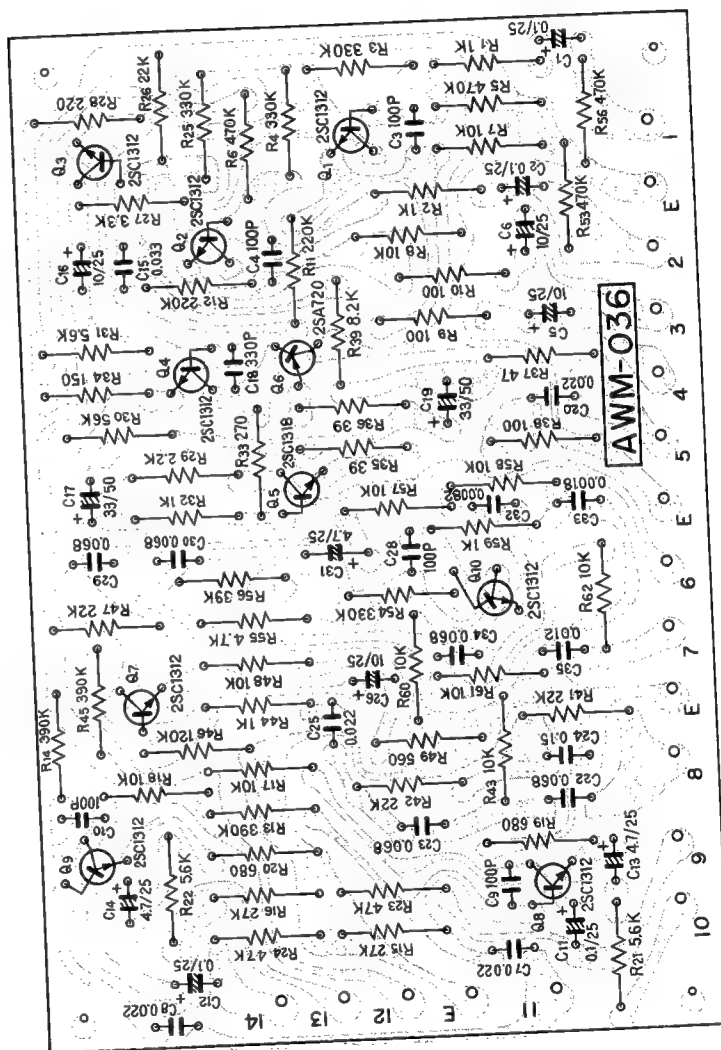
# SEMICONDUCTORS

Symbol	Description	Part No.
Q1	2SC1312-G or 2SC1344-E Transistor	
Q2	2SC1312-G or 2SC1344-E Transistor	
Q3	2SC1312-G or 2SC1344-E Transistor	
Q4	2SC1312-G or 2SC1344-E Transistor	
Q5	2SC1312-G or 2SC1344-E Transistor	
Q6	2SC1312-G or 2SC1344-E Transistor	
Q7	2SK30A-GR FET	
Q8	2SK30A-GR FET	
D1	1S188 FM-1 Diode	
D2	1S188 FM-1 Diode	
D3	1S188 FM-1 Diode	
D4	1S188 FM-1 Diode	
D5	1S2473 Diode	
D6	1S2473 Diode	



# 12.13 REVERB AMP UNIT (AWM-036-0)





## 72 PARTS LIST OF REVERB AMP UNIT

### CAPACITORS

Symbol	Description	Part No.
C1	Electrolytic 0.1 25V	CEA 0R1P 25
C2	Electrolytic 0.1 25V	CEA 0R1P 25
C3	Ceramic 100p 50V	CCDSL 101K 50
C4	Ceramic 100p 50V	CCDSL 101K 50
C5	Electrolytic 10 25V	CEA 100P 25
C6	Electrolytic 10 25V	CEA 100P 25
C7	Mylar 0.022 50V	CQMA 223K 50
C8	Mylar 0.022 50V	CQMA 223K 50
C9	Ceramic 100p 50V	CCDSL 101K 50
C10	Ceramic 100p 50V	CCDSL 101K 50
C11	Electrolytic 0.1 25V	CEA 0R1P 25
C12	Electrolytic 0.1 25V	CEA 0R1P 25
C13	Electrolytic 4.7 25V	CSSA 4R7M 25
C14	Electrolytic 4.7 25V	CSSA 4R7M 25
C15	Mylar 0.033 50V	CQMA 333K 50
C16	Electrolytic 10 25V	CEA 100P 25
C17	Electrolytic 33 50V	CEA 330P 50
C18	Ceramic 330p 50V	CCDSL 331K 50
C19	Electrolytic 33 50V	CEA 330P 50
C20	Mylar 0.022 50V	CQMA 223K 50
C22	Mylar 0.068 50V	CQMA 683K 50
C23	Mylar 0.068 50V	CQMA 683K 50
C24	Mylar 0.15 50V	CQMA 154K 50
C25	Mylar 0.022 50V	CQMA 223K 50
C26	Electrolytic 10 25V	CEA 100P 25

Symbol	Description	Part No.
C28	Ceramic 100p 50V	CCDSL 101K 50
C29	Mylar 0.068 50V	CQMA 683K 50
C30	Mylar 0.068 50V	CQMA 683K 50
C31	Electrolytic 4.7 25V	CSSA 4R7M 25
C33	Mylar 0.0018 50V	CQMA 182K 50
C34	Mylar 0.068 50V	CQMA 683K 50

### RESISTORS

Symbol	Description	Part No.
R1	Carbon film 1k	RD%PS 102J
R2	Carbon film 1k	RD%PS 102J
R3	Carbon film 330k	RD%PS 334J
R4	Carbon film 330k	RD%PS 334J
R5	Carbon film 470k	RD%PS 474J
R6	Carbon film 470k	RD%PS 474J
R7	Carbon film 10k	RD%PS 103J
R8	Carbon film 10k	RD%PS 103J
R9	Carbon film 100	RD%PS 101J
R10	Carbon film 100	RD%PS 101J
R11	Carbon film 220k	RD%PS 224J
R12	Carbon film 220k	RD%PS 224J
R13	Carbon film 390k	RD%PS 394J
R14	Carbon film 390k	RD%PS 394J
R15	Carbon film 27k	RD%PS 273J

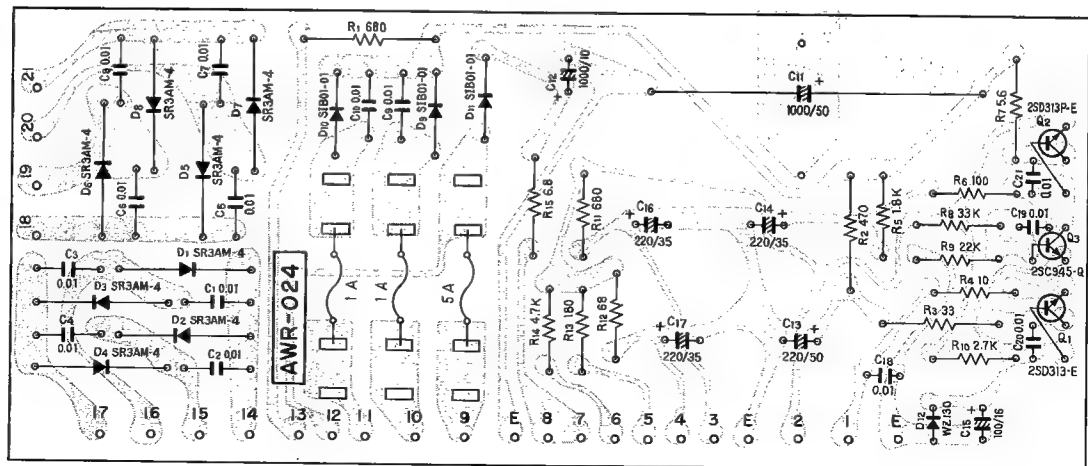
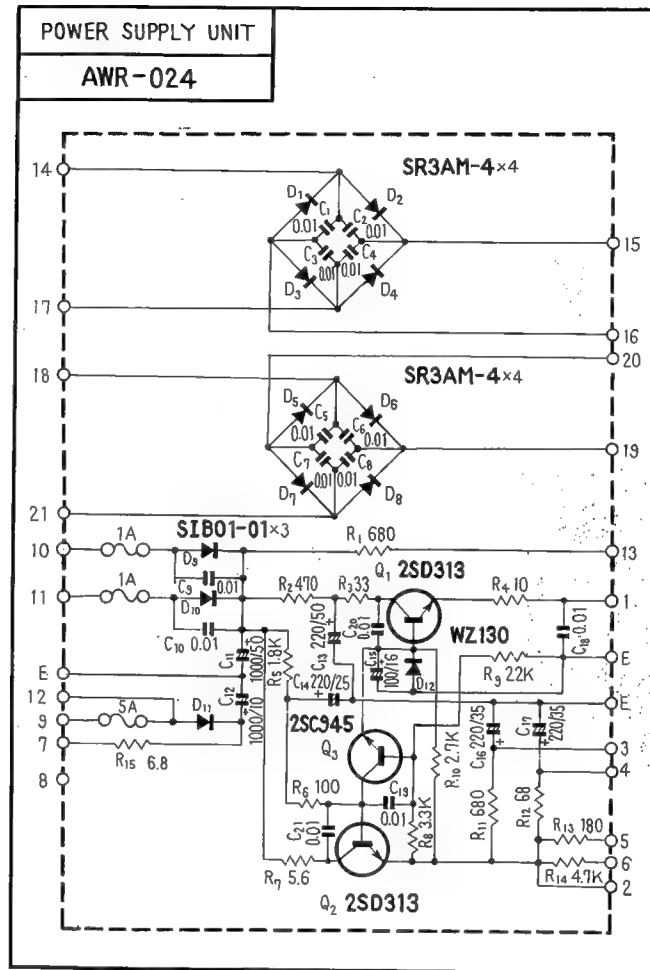
Symbol	Description	Part No.
R47	Carbon film	RD%PS 223J
R48	Carbon film	RD%PS 103J
R49	Carbon film	RD%PS 561J
R52	Carbon film	RD%PS 474J
R53	Carbon film	RD%PS 474J
R54	Carbon film	RD%PS 334J
R55	Carbon film	RD%PS 472J
R56	Carbon film	RD%PS 393J
R57	Carbon film	RD%PS 103J
R58	Carbon film	RD%PS 103J
R59	Carbon film	RD%PS 102J
R60	Carbon film	RD%PS 103J
R61	Carbon film	RD%PS 103J
R62	Carbon film	RD%PS 103J

# SEMICONDUCTORS

Symbol	Description	Part No.
Q1	2SC1312-F or G	Transistor
Q2	2SC1312-F or G	Transistor
Q3	2SC1312-F or G	Transistor
Q4	2SC1318-R or Q	Transistor
Q5	2SC1318-R or Q	Transistor
Q6	2SA720-R or Q	Transistor
Q7	2SC1312-F or G	Transistor
Q8	2SC1312-F or G	Transistor
Q9	2SC1312-F or G	Transistor
Q10	2SC1312-F or G	Transistor

Symbol	Description	Part No.
R16	Carbon film	RD%PS 273J
R17	Carbon film	RD%PS 103J
R18	Carbon film	RD%PS 103J
R19	Carbon film	RD%PS 681J
R20	Carbon film	RD%PS 681J
R21	Carbon film	RD%PS 562J
R22	Carbon film	RD%PS 562J
R23	Carbon film	RD%PS 473J
R24	Carbon film	RD%PS 473J
R25	Carbon film	RD%PS 334J
R26	Carbon film	RD%PS 223J
R27	Carbon film	RD%PS 332J
R28	Carbon film	RD%PS 221J
R29	Carbon film	RD%PS 222J
R30	Carbon film	RD%PS 563J
R31	Carbon film	RD%PS 562J
R32	Carbon film	RD%PS 102J
R33	Carbon film	RD%PS 271J
R34	Carbon film	RD%PS 151J
R35	Carbon film	RD%PS 390J
R36	Carbon film	RD%PS 390J
R37	Carbon film	RD%PS 470J
R38	Carbon film	RD%PS 101J
R39	Carbon film	RD%PS 822J
R41	Carbon film	RD%PS 223J
R42	Carbon film	RD%PS 223J
R43	Carbon film	RD%PS 103J
R44	Carbon film	RD%PS 102J
R45	Carbon film	RD%PS 394J
R46	Carbon film	RD%PS 124J

## 12.14 POWER SUPPLY UNIT (AWR-024-A)



# PARTS LIST OF POWER SUPPLY UNIT

## CAPACITORS

Symbol	Description	Part No.
C1	Ceramic 0.01 150V	ACG-002-0
C2	Ceramic 0.01 150V	ACG-002-0
C3	Ceramic 0.01 150V	ACG-002-0
C4	Ceramic 0.01 150V	ACG-002-0
C5	Ceramic 0.01 150V	ACG-002-0
C6	Ceramic 0.01 150V	ACG-002-0
C7	Ceramic 0.01 150V	ACG-002-0
C8	Ceramic 0.01 150V	ACG-002-0
C9	Ceramic 0.01 150V	ACG-002-0
C10	Ceramic 0.01 150V	ACG-002-0
C11	Electrolytic 1000 50V	CEB 102P 50
C12	Electrolytic 1000 10V	CEA 102P 10
C13	Electrolytic 220 50V	CEA 221P 50
C14	Electrolytic 220 35V	CEA 221P 35
C15	Electrolytic 100 16V	CEA 101P 16
C16	Electrolytic 220 35V	CEA 221P 35
C17	Electrolytic 220 35V	CEA 221P 35
C19	MyIar 0.001 50V	COMA 102K 50
C20	MyIar 0.001 50V	COMA 102K 50
C21	MyIar 0.001 50V	COMA 102K 50

## RESISTORS

Symbol	Description	Part No.
R1	Metal oxide 680 1W	RS1P 681K
R2	Metal oxide 470 2W	RS2P 471K
R3	Metal oxide 33 1W	RS1P 330K
R4	Carbon film 10	RD1/PS 100J
R5	Carbon film 1.8k	RD1/PS 182J
R6	Carbon film 100	RD1/PS 101J
R7	Carbon film 5.6	RD1/PS 5R6J
R8	Carbon film 33k	RD1/PS 333J
R9	Carbon film 22k	RD1/PS 223J
R10	Carbon film 2.7k	RD1/PS 272J
R11	Carbon film 680	RD1/PS 681J
R12	Carbon film 68	RD1/PS 680J
R13	Carbon film 180	RD1/PS 181J
R14	Carbon film 4.7k	RD1/PS 472J
R15	Carbon film 6.8	RD1/PS 6R8J

## SEMICONDUCTORS

Symbol	Description	Part No.
Q1	2SD313-E or R Transistor	
Q2	2SD313P-E or R Transistor	
Q3	2SC945-Q or R Transistor	
D1	SR3AM-4 Diode	
D2	SR3AM-4 Diode	
D3	SR3AM-4 Diode	
D4	SR3AM-4 Diode	
D5	SR3AM-4 Diode	

QX-9900

**POWER SUPPLY UNIT**  
(continued)

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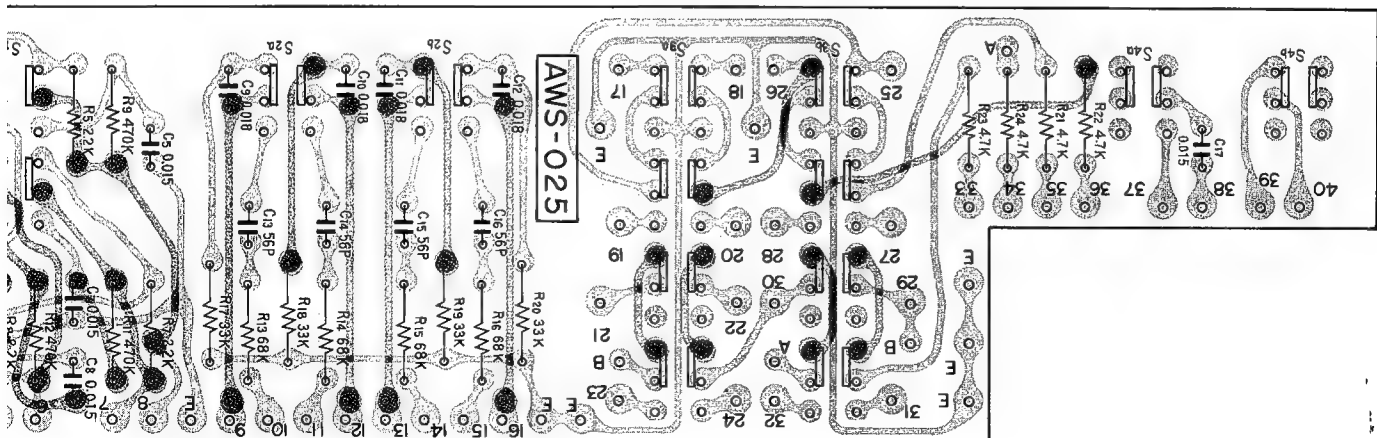
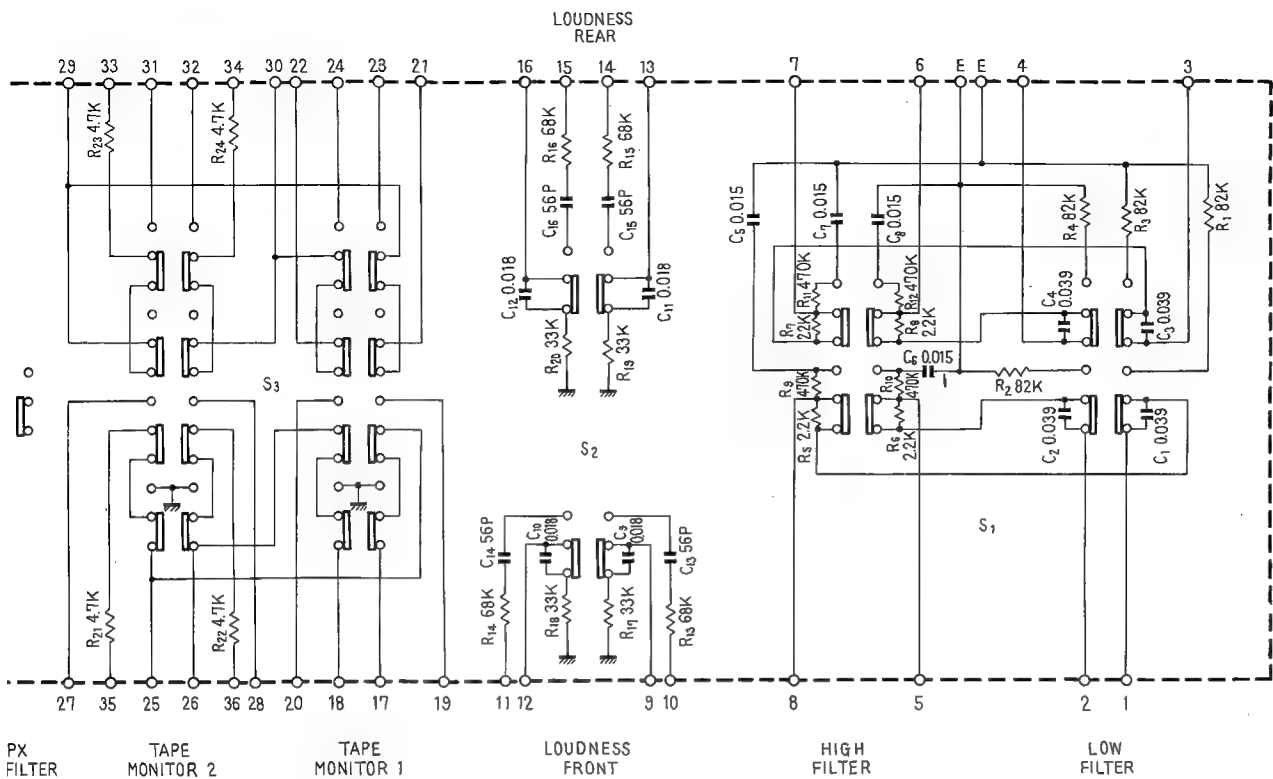
Symbol	Description	Part No.
D6	SR3AM-4	
D7	SR3AM-4	
D8	SR3AM-4	
D9	SIB01-01	
D10	SIB01-01	
D11	SIB01-01	
D12	WZ130	
	Diode	
	Diode	
	Diode	
	Diode	
	Diode	
	Diode	
	Zener diode	

**OTHERS**

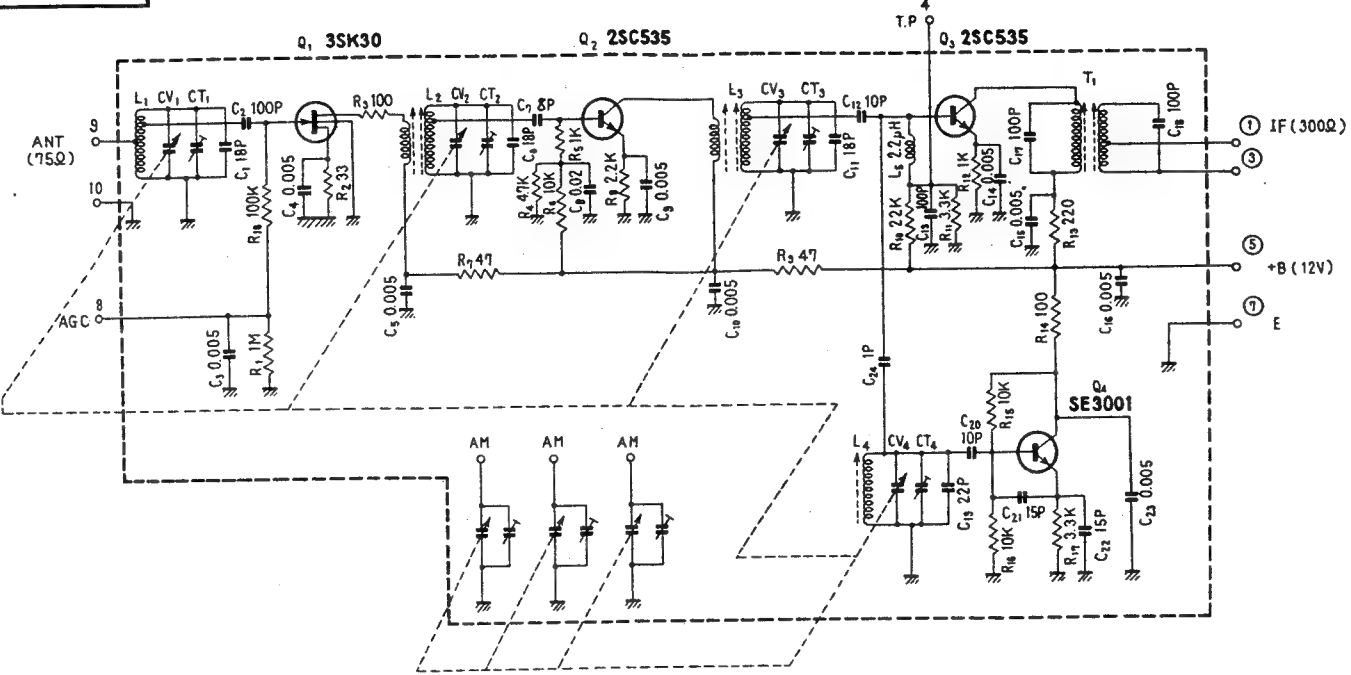
Symbol	Description	Part No.
	Fuse 1A	E21-004-0
	Fuse 5A	E21-013-0



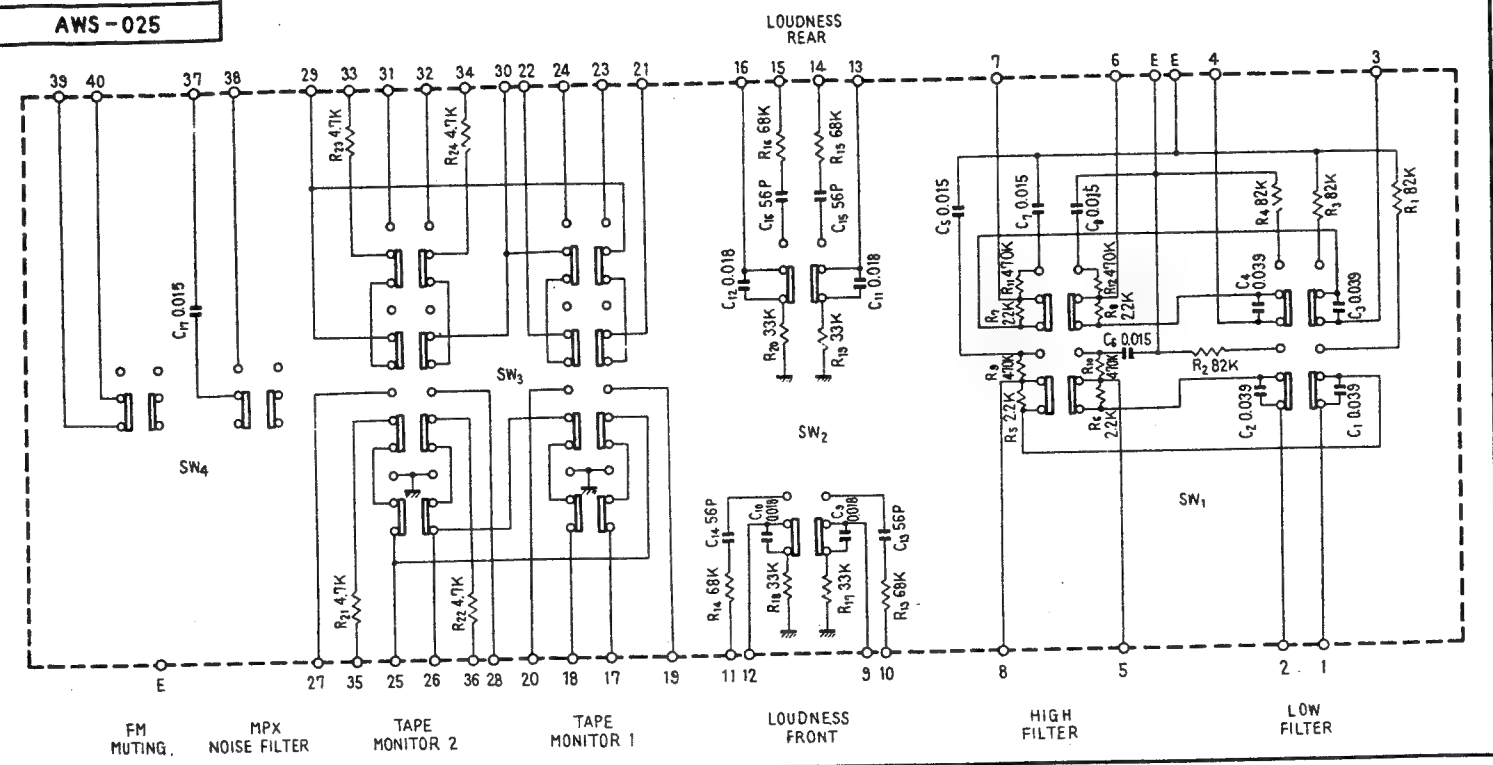
# 12.15 MINI-SWITCH UNIT (AWS-025-0)



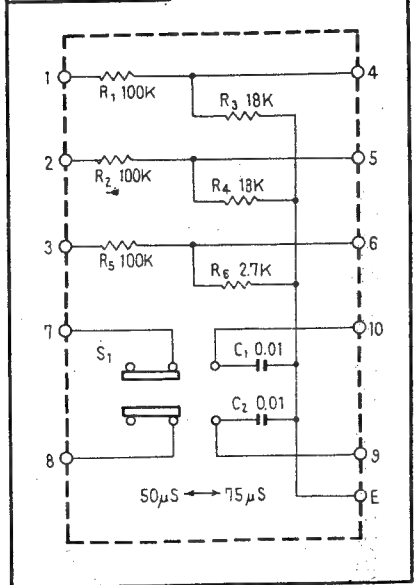
FM FRONT END  
W11-045  
AWB-006



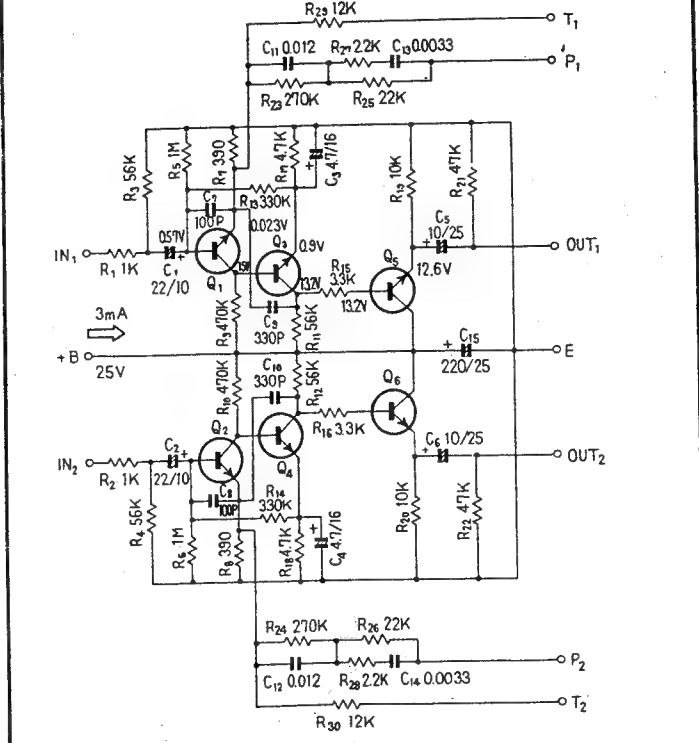
MINI SWITCH UNIT  
AWS-025



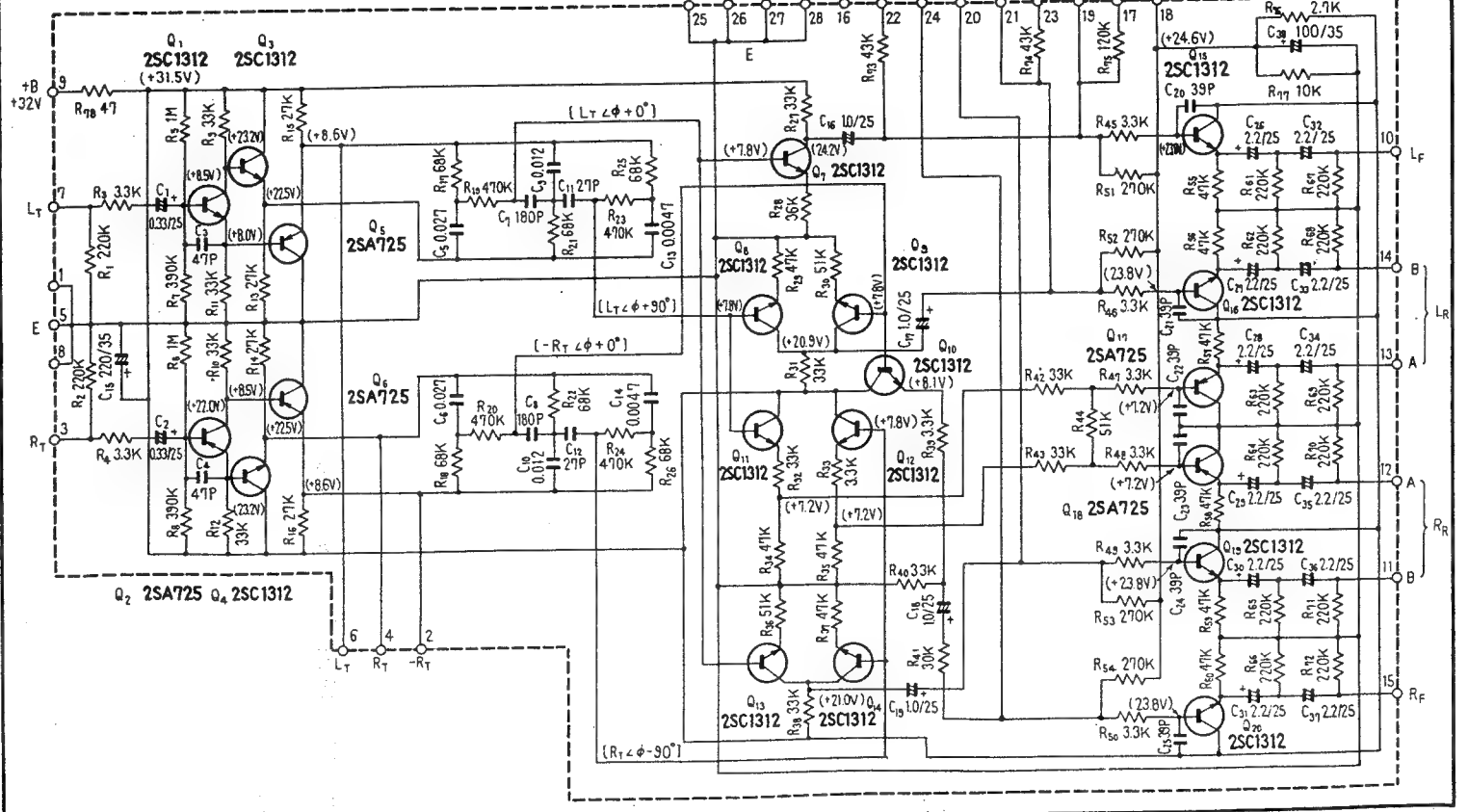
CR UNIT  
AWX-037



HEAD AMP UNIT  
W21-002



DECODER UNIT  
AWM-031



NI-SWITCH UNIT

ption		Part No.	
0.039	50V	CQMA 3 93K 50	
0.039	50V	CQMA 3 93K 50	
0.039	50V	CQMA 3 93K 50	
0.039	50V	CQMA 3 93K 50	
0.015	50V	CQMA 153K 50	
0.015	50V	CQMA 153K 50	
0.015	50V	CQMA 153K 50	
0.015	50V	CQMA 153K 50	
0.018	50V	CQMA 183K 50	
0.018	50V	CQMA 183K 50	
0.018	50V	CQMA 183K 50	
0.018	50V	CQMA 183K 50	
56p	50V	CCDSL 560K 50	
56p	50V	CCDSL 560K 50	
56p	50V	CCDSL 560K 50	
56p	50V	CCDSL 560K 50	
0.015	50V	CQMA 153K 50	

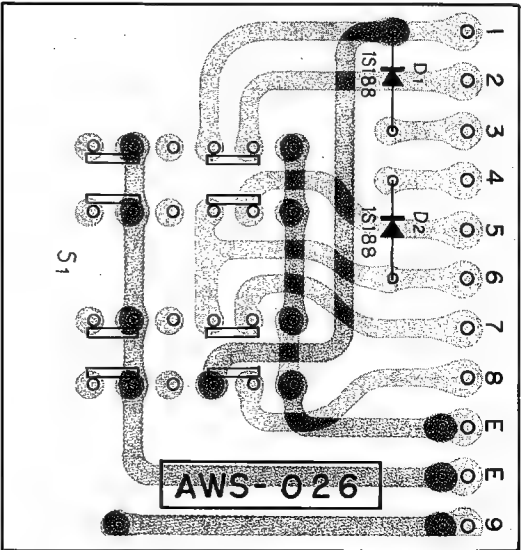
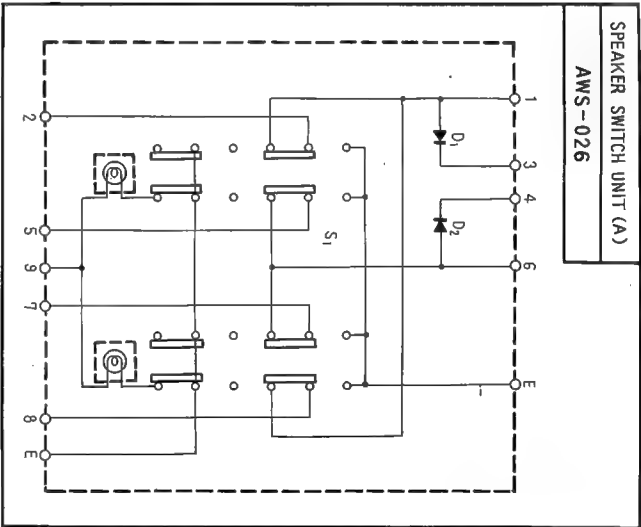
Symbol	Description		Part No.
R6	Carbon film	2.2k	RD¼PS 222J
R7	Carbon film	2.2k	RD¼PS 222J
R8	Carbon film	2.2k	RD¼PS 222J
R9	Carbon film	470k	RD¼PS 474J
R10	Carbon film	470k	RD¼PS 474J
R11	Carbon film	470k	RD¼PS 474J
R12	Carbon film	470k	RD¼PS 474J
R13	Carbon film	68k	RD¼PS 683J
R14	Carbon film	68k	RD¼PS 683J
R15	Carbon film	68k	RD¼PS 683J
R16	Carbon film	68k	RD¼PS 683J
R17	Carbon film	33k	RD¼PS 333J
R18	Carbon film	33k	RD¼PS 333J
R19	Carbon film	33k	RD¼PS 333J
R20	Carbon film	33k	RD¼PS 333J
R21	Carbon film	4.7k	RD¼PS 472J
R22	Carbon film	4.7k	RD¼PS 472J
R23	Carbon film	4.7k	RD¼PS 472J
R24	Carbon film	4.7k	RD¼PS 472J

ption		Part No.	
82k		RD¼PS 823J	
82k		RD¼PS 823J	
82k		RD¼PS 823J	
82k		RD¼PS 823J	
2.2k		RD¼PS 222J	

SWITCHES

Symbol	Description	Part No.
S1	Mini-switch	ASG-033-0
S2	Mini-switch	ASG-032-0
S3	Mini-switch	ASG-034-0
S4	Mini-switch	ASG-032-0

12.16 SPEAKER SWITCH UNIT (A) (AWS-026-0)

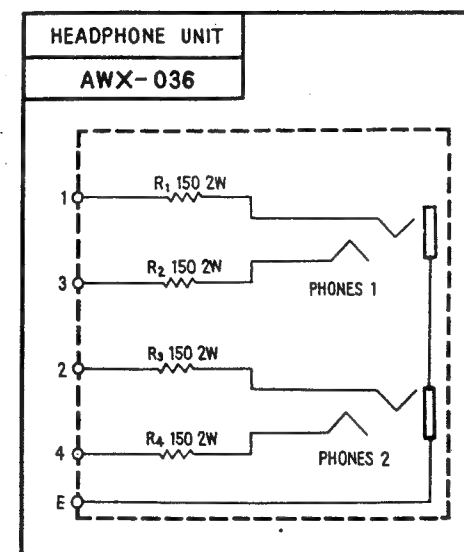
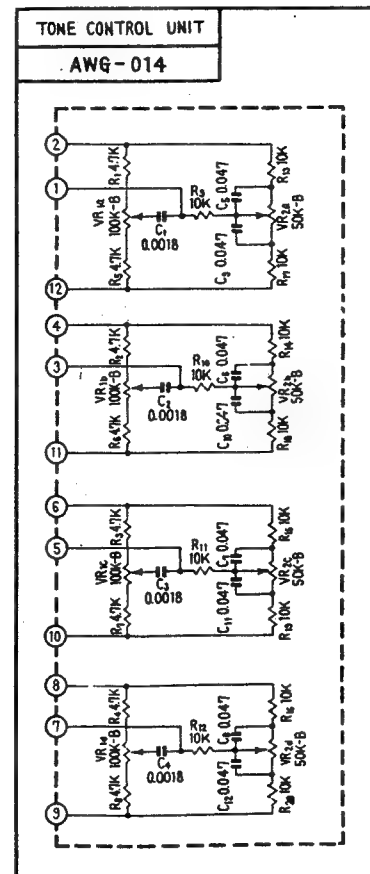
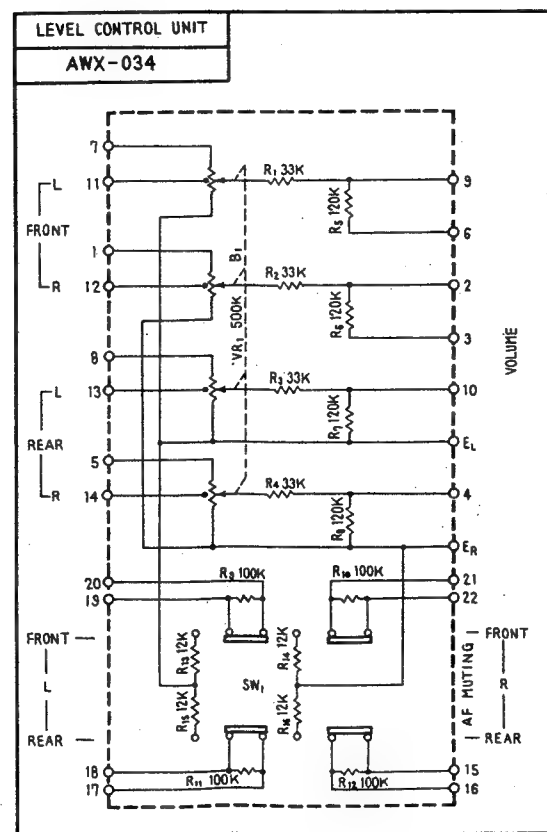
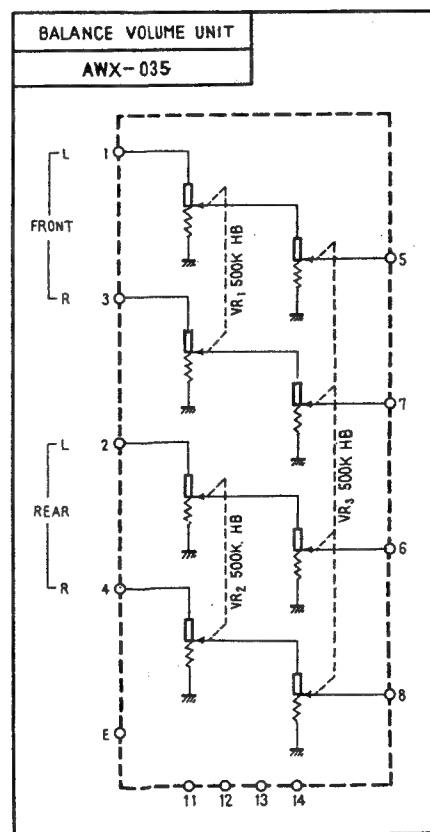
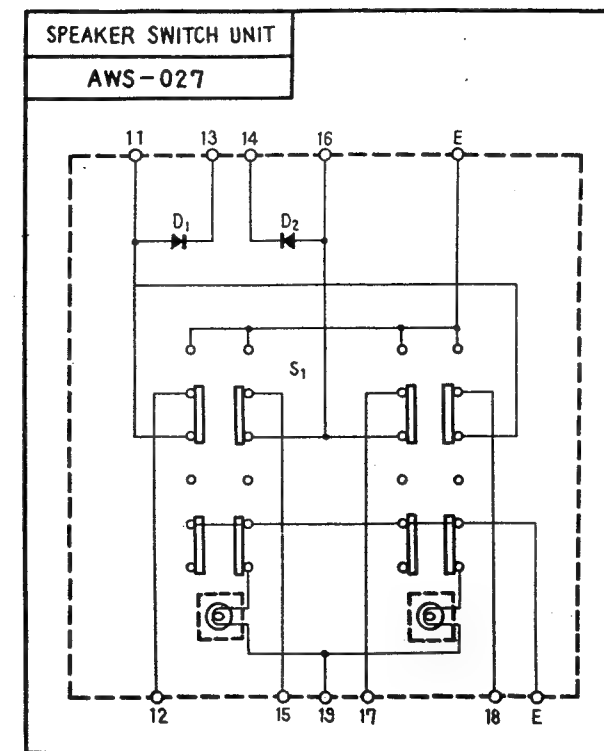
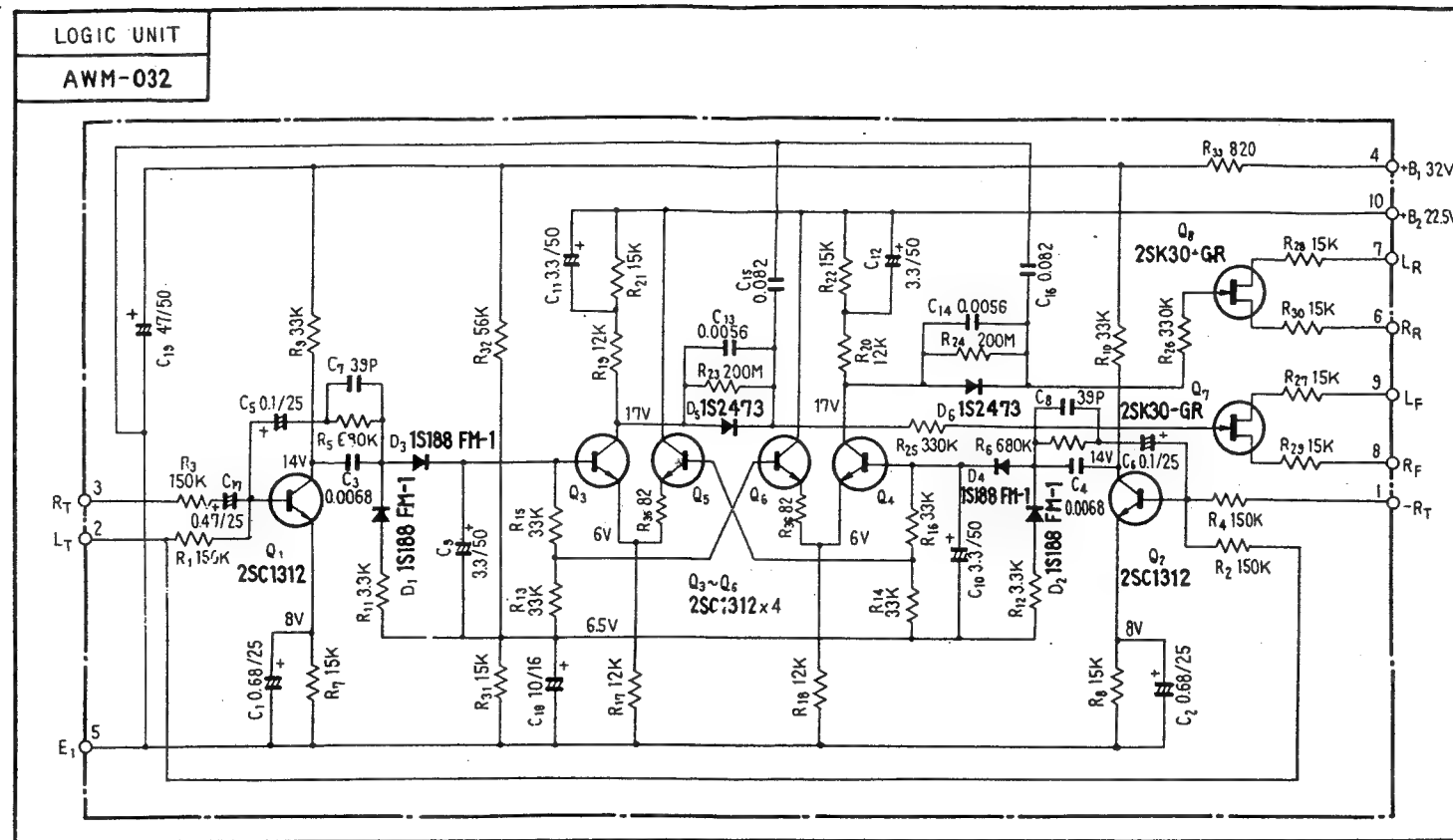


SEMICONDUCTORS

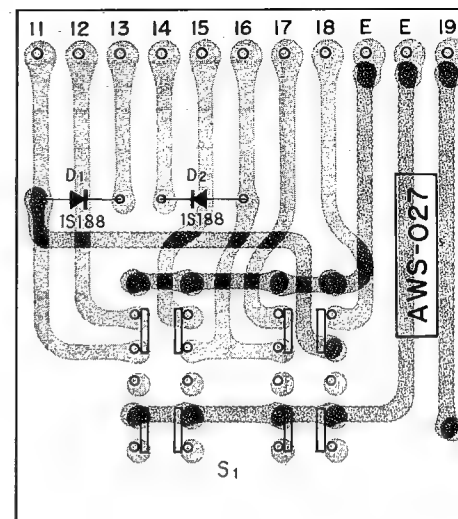
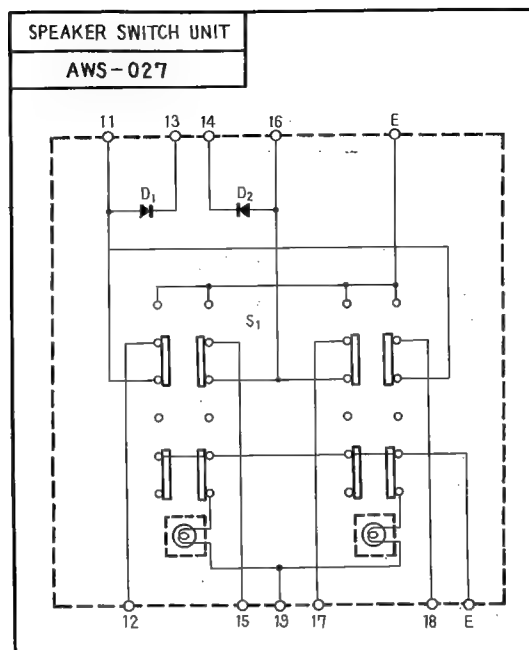
Symbol	Description	Part No.
D1	1S188 FM-1	
D2	1S188 FM-1 Diode	

SWITCH

Symbol	Description	Part No.
S1	Mini-switch	ASG-031-A



# 12.17 SPEAKER SWITCH UNIT (B) (AWS-027-0)



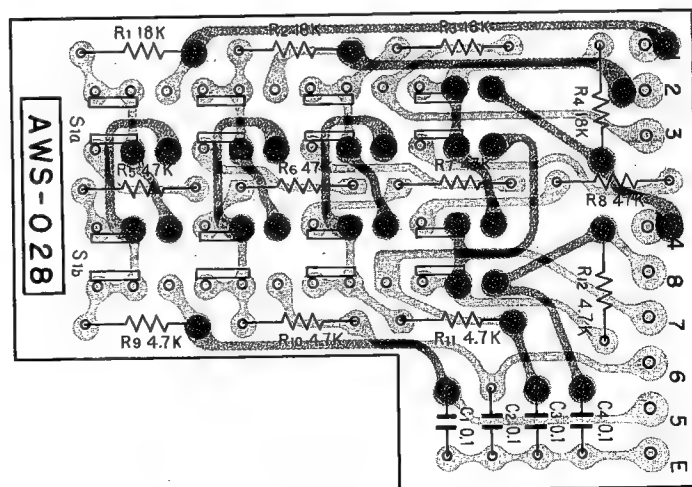
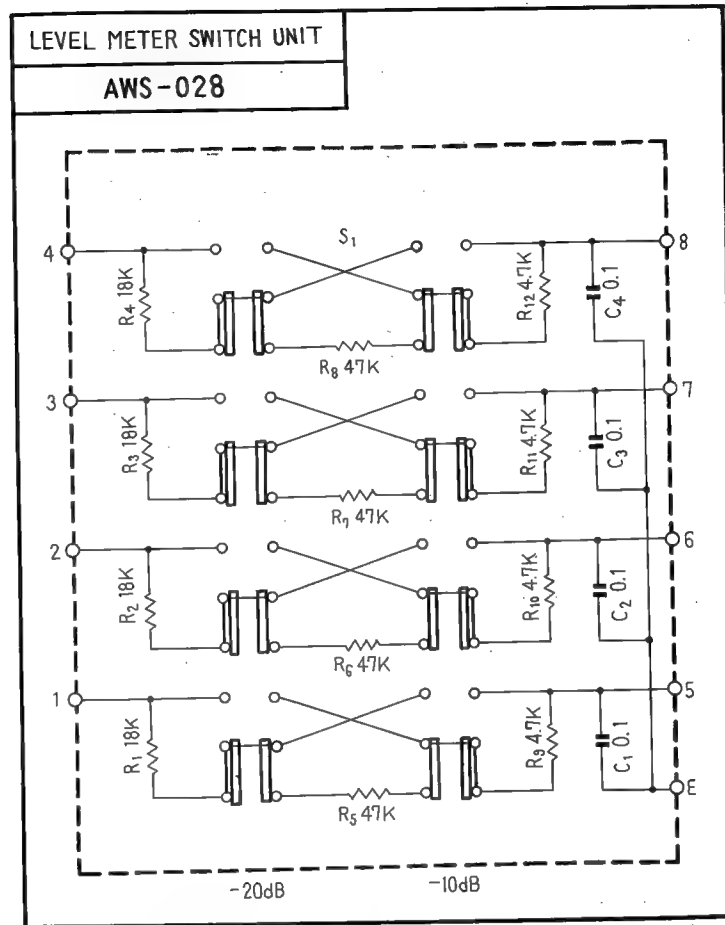
## SEMICONDUCTORS

Symbol	Description	Part No.	
D1	1S188 FM-1 Diode		
D2	1S188 FM-1 Diode		

## SWITCH

Symbol	Description	Part No.	
S1	Mini-switch	ASG-031-A	

# 12.18 LEVEL METER SWITCH UNIT (AWS-028-0)



**PARTS LIST OF LEVEL METER SWITCH UNIT**
**CAPACITORS**

Symbol	Description			Part No.	
C1	Mylar	0.1	50V	CQMA 104K 50	
C2	Mylar	0.1	50V	CQMA 104K 50	
C3	Mylar	0.1	50V	CQMA 104K 50	
C4	Mylar	0.1	50V	CQMA 104K 50	

**RESISTORS**

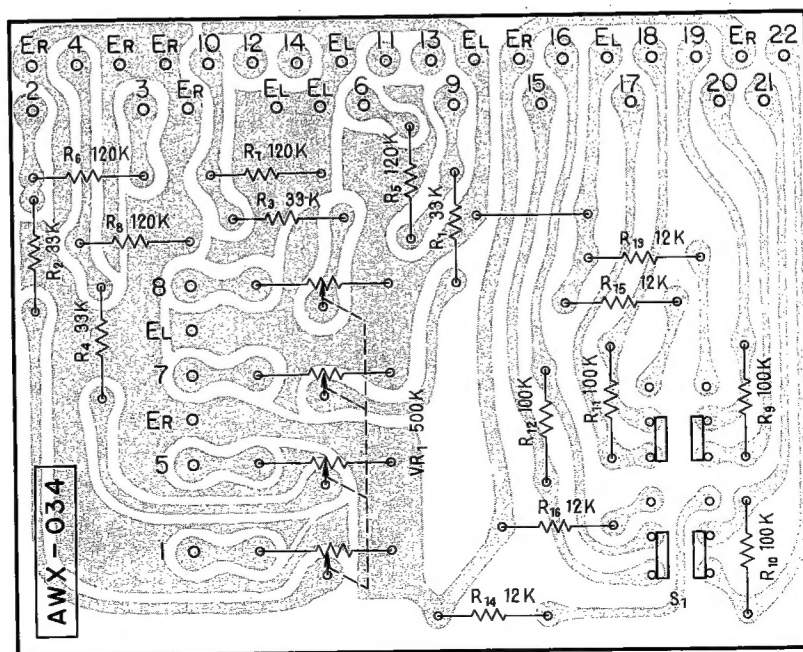
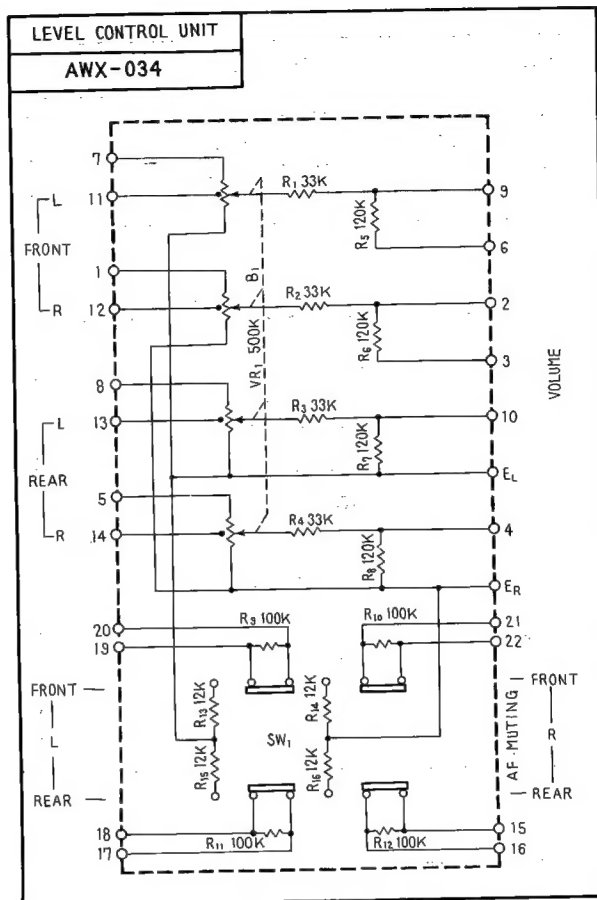
Symbol	Description			Part No.	
R1	Carbon film	18k		RD%PS 183J	
R2	Carbon film	18k		RD%PS 183J	
R3	Carbon film	18k		RD%PS 183J	
R4	Carbon film	18k		RD%PS 183J	
R5	Carbon film	47k		RD%PS 473J	
R6	Carbon film	47k		RD%PS 473J	
R7	Carbon film	47k		RD%PS 473J	
R8	Carbon film	47k		RD%PS 473J	
R9	Carbon film	4.7k		RD%PS 472J	
R10	Carbon film	4.7k		RD%PS 472J	
R11	Carbon film	4.7k		RD%PS 472J	
R12	Carbon film	4.7k		RD%PS 472J	

**SWITCH**

Symbol	Description	Part No.	
S1	Mini-switch	ASG-030-0	



## 12.19 LEVEL CONTROL UNIT (AWX-034-A)



## PARTS LIST OF LEVEL CONTROL UNIT

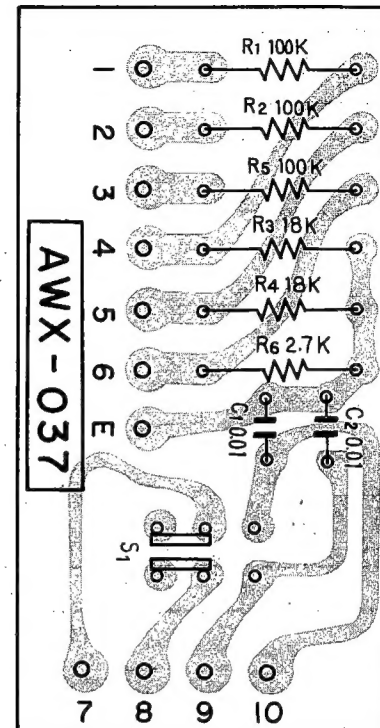
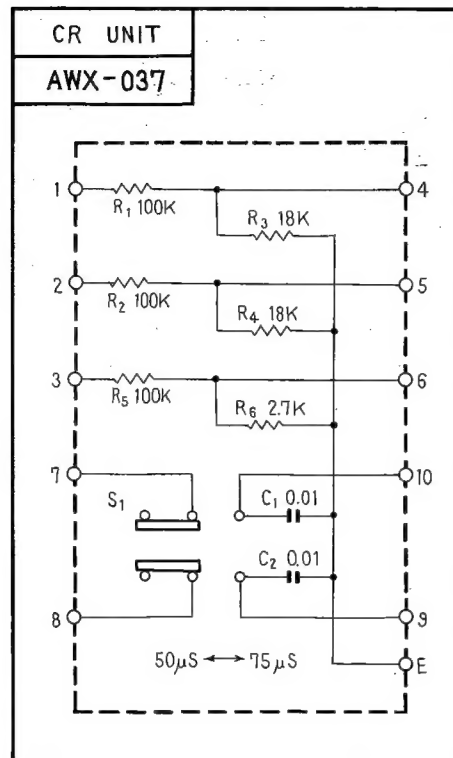
## RESISTORS

Symbol	Description	Part No.	
R1	Carbon film 33k	RD4PS 333J	
R2	Carbon film 33k	RD4PS 333J	
R3	Carbon film 33k	RD4PS 333J	
R4	Carbon film 33k	RD4PS 333J	
R5	Carbon film 120k	RD4PS 124J	
R6	Carbon film 120k	RD4PS 124J	
R7	Carbon film 120k	RD4PS 124J	
R8	Carbon film 120k	RD4PS 124J	
R9	Carbon film 100k	RD4PS 104J	
R10	Carbon film 100k	RD4PS 104J	
R11	Carbon film 100k	RD4PS 104J	
R12	Carbon film 100k	RD4PS 104J	
R13	Carbon film 12k	RD4PS 123J	
R14	Carbon film 12k	RD4PS 123J	
R15	Carbon film 12k	RD4PS 123J	
R16	Carbon film 12k	RD4PS 123J	
VR1	4-gang, volume	ACV-307-0	

## SWITCH

Symbol	Description	Part No.	
S1	Push switch	ASG-029-0	

## 12.22 CR UNIT (AWX-037-0)



### CAPACITORS

Symbol	Description			Part No.	
C1	Mylar	0.01	50V	CQMA 103K 50	
C2	Mylar	0.01	50V	CQMA 103K 50	

### RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	100k		RD%PS 104J	
R2	Carbon film	100k		RD%PS 104J	
R3	Carbon film	18k		RD%PS 183J	
R4	Carbon film	18k		RD%PS 183J	
R5	Carbon film	100k		RD%PS 104J	
R6	Carbon film	2.7k		RD%PS 272J	

### SWITCH

Symbol	Description			Part No.	
S1	Slide switch			ASH-002-0	

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